HELMINTHOLOGICAL ABSTRACTS

VOL. 22

incorporating
BIBLIOGRAPHY OF HELMINTHOLOGY
For the Year 1953

COMMONWEALTH BUREAU OF HELMINTHOLOGY
The White House, 103 St. Peter's Street
St. Albans, England.

Vol. 22, Part 1 Nos. 1-64

HELMINTHOLOGICAL ABSTRACTS

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BIBLIOGRAPHY OF HELMINTHOLOGY

COMPILED FROM WORLD LITERATURE OF 1953

Prepared by the

COMMONWEALTH BUREAU OF AGRICULTURAL PARASITOLOGY
(HELMINTHOLOGY)

Published by the

COMMONWEALTH AGRICULTURAL BUREAUX, FARNHAM ROYAL, ENGLAND

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1953

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HELMINTHOLOGICAL ABSTRACTS

INCORPORATING BIBLIOGRAPHY OF HELMINTHOLOGY

FOR THE YEAR 1953

Vol. 22, Part 1

1—Acta Tropica. Basle.

a. BAER, J. G., 1953.—" Notes de faunistique éburnéenne. IV. *Bertiella douceti* n.sp., cestode nouveau de l'anomalure de pel." **10** (1), 79–82.

(1a) *Bertiella douceti* n.sp. is described and figured from *Anomalurus peli* from the Yaboisso forest in Ouellé, Dimbokro District. It is easily differentiated from *B. congolensis* by the absence of spines on the cirrus, the smaller size of the cirrus pouch, the greater number (about 130) of testes, and the relatively larger size of the ovary and vitelline gland. Baer recalls that in 1927 he regrouped the species of *Bertiella* into *Bertiella* sensu stricto and *Prototaenia*. He is of the opinion that *B. kapul* and *B. anapolytica* should be transferred to *Prototaenia* and remarks on the morphological similarity of *P. anapolytica* to *P. plastica*. R.T.L.

2—Advisory Leaflet. Ministry of Agriculture and Fisheries. London.

a. ANON., 1953.—" Stem and bulb eelworm on clover." No. 409, 5 pp.

3—Agricultural Gazette of New South Wales.

a. ANON., 1953.—" New plant diseases." **64** (1), 34–35.

(3a) The following eelworm infections of plants are recorded for New South Wales for the first time, viz., (i) *Heterodera marioni* in *Acanthus mollis*, *Asparagus officinalis*, *Fragaria* hort.var., *Luculia gratissima*, *Phytolacca octandra* and *Zinnia elegans*; (ii) *Aphelenchoides fragariae* in *Begonia* sp. and *Sinningia speciosa*. R.T.L.

4—Agricultural Institute Review. Ottawa.

a. MONRO, H. A. U., 1953.—" Fumigants and agriculture." **8** (2), 15–17.
b. BAKER, A. D., 1953.—" Chemical control of plant-parasitic nematodes." **8** (2), 21–22.

(4a) The chief fumigants now being used in agriculture are briefly summarized. The introduction of D-D mixture and later of ethylene dibromide has affected many aspects of crop protection. Soil fumigants have long term as well as immediate effects. There is often a marked stimulation of plant growth or an increase in yield not always attributable to pest control. These reactions may be beneficial changes in the composition of soil organisms, alteration in the soil texture, and chemical reactions resulting in better availability of nutrients. By applying different fumigants to different types of soil, almost any degree of combination of these effects can be attained. R.T.L.

(4b) Baker thinks that care should be exercised in accepting reports on the nematicidal value of fumigants solely from the size of the first crop obtained after treatment. Additional valuable information may be obtained by replanting the crop in the second and even the third year after fumigation and nematode counts should be made to determine the mortality. Although heavy applications of fumigants may kill more nematodes than lighter applications, they may interfere with plant growth. Some fumigants may remain in the soil for a surprisingly long time and, as in crops like sugar-beet, may result in a peculiar root system. Attention is drawn to the possibility that the so-called stimulating effects on plant growth may be due to the killing of large populations of hitherto unsuspected ectoparasitic nematodes. R.T.L.

5—American Journal of Hygiene.

a. LI, S. Y., 1953.—" Studies on schistosomiasis japonica in Formosa. III. The bionomics of *Oncomelania formosana*, a molluscan intermediate host of *Schistosoma japonicum*." **57** (1), 30–45.
b. SMITH, P. E., 1953.—" Life history and host-parasite relations of *Heterakis spumosa*, a nematode parasite in the colon of the rat." **57** (2), 194–221.

(5a) In Changhua Hsien, a newly discovered endemic area of schistosomiasis japonica in mid-western Formosa, the reproductive activity of *Oncomelania formosana* reaches a peak in February and gradually decreases until October. Hibernation usually occurs in November and December. Young snails are most abundant in March. Most of the snails live for about one year. The life-cycle of *Schistosoma japonicum* in the molluscan host usually lasts from three to five months and cercariae are shed for one to three months. R.T.L.

(5b) Smith, investigating the basis of the resistance acquired by the rat to infection with *Heterakis spumosa*, finds that the larvae penetrate the epithelial tissue of the mucosa of the upper colon and lie partially in the reticular tissue where they remain for a very short time. In a second infection the larvae apparently failed to penetrate the mucosa. This demonstration of tissue invasion, hitherto unknown in this species, revealed a source of antigenic stimulus. The formation of precipitate around larvae and adults in hyperimmune serum in *in vitro* tests confirmed the antigen-antibody basis of the immune reaction. R.T.L.

6—American Journal of Pathology.

a. GOULD, S. E., VAN DYKE, J. G. & GOMBERG, H. J., 1953.—" Effect of X-rays on trichinae larvae." **29** (2), 323–338.

(6a) Practically all *Trichinella spiralis* larvae were killed within one to two hours after irradiation with 750,000 r. filtered X-rays when applied *in vitro*. Reproduction was largely prevented by exposing larvae *in vitro* to X-rays of 3,500 r. and maturation to adult forms was largely prevented by exposure to 5,000 r. or 6,000 r. "Pieces of trichinous meat 1·45 cm. thick were rendered non-infective to experimental rats when exposed to 15,000 r. This suggests that the dose of X-radiation to sterilize trichina larvae in commercial quantities of pork may not be excessive". It may conceivably be within practical limits to render half a pig carcass safe. R.T.L.

7—American Journal of Tropical Medicine and Hygiene.

a. MOUNT, R. A., 1953.—" Medical mission to the Yemen, southwest Arabia, 1951. I. Geomedical observations." **2** (1), 1–12.
b. KUNTZ, R. E., MALAKATIS, G. M., LAWLESS, D. K. & STROME, C. P. A., 1953.—" Medical mission to the Yemen, southwest Arabia, 1951. II. A cursory survey of the intestinal protozoa and helminth parasites in the people of the Yemen." **2** (1), 13–19.
c. POINDEXTER, H. A., 1953.—" Epidemiological survey among the Gola tribe in Liberia." **2** (1), 30–38.

(7a) A geomedical survey of three geographical regions of the Yemen in 1951 shows that intestinal parasitism is common in the lowlands. Schistosomiasis occurs in the middle heights especially in the vicinity of Ta'izz: in the highlands it is less frequent. R.T.L.

(7b) The rather high rate of infection with *Schistosoma mansoni* in the Yemen is attributed to the use of infected water in ablution pools of mosques. A photograph of these pools is reproduced. Ascaris, Enterobius, Trichuris and Hymenolepis are quite common, and *Taenia saginata* was found in the people of Ma'bar on the San'a plateau, but no hookworm, Wuchereria or Dracunculus was recorded during the mission's brief visit. A single specimen of *Limnatis paluda* was removed from the naso-pharynx of a man at Ta'izz. R.T.L.

(7c) The faeces of 100 boys and 100 girls respectively of the Gola Tribe in Liberia, showed evidence of infection with *Ascaris lumbricoides* in 58% and 66%, Strongyloides larvae in 3% and 10%, Trichuris in 2% and 4%, Enterobius in 1% and 2%. Hookworm was found in 53% and 36% and was recognized as one of the most important diseases. Of a total of 950 individuals examined, 589 were infected with helminths. R.T.L.

7—American Journal of Tropical Medicine and Hygiene (cont.)

d. OLIVER-GONZÁLEZ, J., 1953.—" Intradermal reactions to schistosome and filaria antigens in patients before and after treatment of the parasitic infections." **2** (1), 79–84.
e. McFADZEAN, J. A., 1953.—" Immunity in filariasis of experimental animals." **2** (1), 85–94.
f. GELFAND, M. & ALVES, W. D., 1953.—" Terramycin in schistosomiasis: a trial in six cases." **2** (1), 95–96.
g. BECK, J. W., 1953.—" Xenodiagnostic technic as an aid in diagnosis of trichinosis." **2** (1), 97–101.
h. BEAVER, P. C., 1953.—" Persistence of hookworm larvae in soil." **2** (1), 102–108.

(7d) Individuals with *Schistosoma mansoni*, skin-tested with extracts of dried and powdered *S. mansoni* cercariae, gave positive reactions in over 90% of the patients both before treatment and for prolonged periods, up to four years, after treatment. When skin was tested with dry and powdered adults of *Fasciola hepatica* and of *Pneumonoeces medioplexus*, the percentage of positive reactions diminished greatly after treatment. Individuals with microfilariae of *Wuchereria bancrofti* in their blood were skin-tested with antigen from *Dirofilaria immitis* and *Litomosoides carinii* and with antigen from concentrated microfilariae. Positive reactions were observed with all three types of antigen in over 90% before, as well as two years after, treatment. The tests cannot therefore be used as an indication of the efficacy of treatment, although they are of great value in diagnosis. This is especially so in chronic schistosomiasis, for the presence of schistosome eggs in various organs may sensitize the host for short periods after the worms are destroyed by treatment and positive reactions may result from the presence of a small number of worms which cannot be detected by microscopical techniques. R.T.L.

(7e) Skin tests and *in vitro* experiments on non-pathogenic filarial infections with *Dirofilaria repens* in dogs, an undiagnosed filaria in monkeys and *Litomosoides* in cotton-rats gave only slight immune responses to immune sera from rabbits immunized with *Dirofilaria immitis* antigen. Cotton-rats, immunized by injections of this antigen, developed a higher infection rate than the controls. No evidence was obtained of the passive transfer of immunity by injecting serum from an immunized animal. The results are held to support the view that the more perfect the adaptation of the parasite, the less is the immune response of the host. R.T.I.

(7f) Two cases of schistosomiasis haematobia and three cases of schistosomiasis mansoni, not previously treated, received two capsules, each containing 250 mg. of terramycin, thrice daily for about 16 days; a child, five years old, suffering from schistosomiasis mansoni, received a total of 50 capsules over a period of eight days. Four weeks later all the patients still continued to pass viable eggs. R.T.L.

(7g) Direct microscopical examination of 50 gm. samples of 100 human diaphragms from autopsies in Mexico City revealed low-grade infections with *Trichinella spiralis* in 15%. In 12 of the 15 positive cases there was less than one cyst per gm. of tissue and in 9 less than one cyst per 10 gm. of tissue. Viability of the cysts was ascertained by feeding the material to albino rats. By the older routine of examining only 1 gm. of tissue microscopically and the remainder by the digestion-Baermann method, the majority of these low-grade infections would have been missed. R.T.L.

(7h) As the percentage of hookworm larvae recoverable from infected soil by the Baermann technique is somewhat unpredictable, Beaver has used damp absorbent cotton pads placed in close contact with the moist soil. The larvae migrate upwards into the pads which are then suspended in water in conical flasks. The larvae are pipetted from the sediment and are stained with 1% potassium iodide saturated with iodine for identification. The pads are circular, 16·5 cm. in diameter, and are made of 16 layers of grade 50 absorbent cheese cloth sewn loosely round the edges and at the centre. Further details of the procedure are given. This technique was applied to 18 enclosed units of soil inoculated with equal numbers of hookworm ova and damped daily until the larvae had reached the infective stage. Half of the units were then left to dry and half were damped daily. There was a more rapid reduction in

7—American Journal of Tropical Medicine and Hygiene (cont.)

i. EYLES, D. E., JONES, F. E. & SMITH, C. S., 1953.—"A study of *Endamoeba histolytica* and other intestinal parasites in a rural West Tennessee community." **2** (2), 173–190.
j. McCOWEN, M. C., CALLENDER, M. E., LAWLIS, Jr., J. F. & BRANDT, M. C., 1953.—" The effects of erythromycin (Ilotycin, Lilly) against certain parasitic organisms." **2** (2), 212–218.
k. SADUN, E. H. & VAJRASTHIRA, S., 1953.—" Studies on intestinal parasitic infections in Cholburi Province (Thailand)." **2** (2), 286–297.
l. OLIVIER, L. & SCHNEIDERMANN, M., 1953.—"Acquired resistance to *Schistosoma mansoni* infection in laboratory animals." **2** (2), 298–306.
m. PÉREZ-SANTIAGO, E., OLIVER-GONZÁLEZ, J. & THILLET, C. J., 1953.—" The effect of a cyanine dye on infections with hookworm and Trichuris in man." **2** (2), 307–310.
n. HOFFMAN, D. O. & ZAKHARY, R., 1953.—" The relationship of exposure time to the molluscicidal activity of copper sulfate." **2** (2), 332–336.

the number of larvae in the damped than in the dry series, confirming the view that the death of infective hookworm larvae under natural conditions is hastened by alternate wetting and drying of the soil. When infective larvae were poured on to damp soil, less than half reached a depth sufficient to enable them to escape desiccation. On the surface of well drained, sandy soils larvae remain viable only for a few minutes after rain ceases and the soil becomes practically non-infective after short periods of frequent rainfall. R.T.L.

(7i) The prevalence rate of helminth parasites in 532 households comprising 2,657 persons in a rural population of Fayette County, Tennessee, was higher in families than in individuals. *Ascaris lumbricoides* occurred in 11·6% of the families and 4·3% of the individuals. *Hymenolepis nana* was present in 2·6% of the families and 0·8% of the individuals. Four individuals had *Necator americanus*, one had *Trichuris trichiura* and three had *Hymenolepis diminuta*. R.T.L.

(7j) Erythromycin, incorporated in concentrations of 0·5%, 0·25% and 0·125% in a commercial laboratory mouse diet, was fed for seven days to three groups of white mice which harboured naturally acquired infections of *Syphacia obvelata* and *Aspiculuris tetraptera*. They were then deprived of food for 24 hours and autopsied. All the mice in the three groups had been cleared of *S. obvelata*. The number of *A. tetraptera* was significantly reduced in each group. The few worms recovered were immature. R.T.L.

(7k) In the urban population of the Cholburi Province of Thailand, Ascaris is the most prevalent parasite. In the rural population, hookworm is the predominant helminth infection. R.T.L.

(7l) It is shown that resistance to reinfection with *Schistosoma mansoni* develops in laboratory mice and hamsters. The effect of pre-existing experimental infection on (i) the ability of mice to tolerate heavy re-exposure and (ii) the number of worms resulting from a superimposed infection are tabulated. The survival time was spread over a much longer period than that of the controls. Significantly fewer new worms developed in the super-infected animals than in the controls. R.T.L.

(7m) A compound, No. 715 (Hales & Welch, 1952), closely related to a group of cyanine dyes, removed some hookworms and whipworms from patients but the number was considerably less than that recovered after the use of tetrachlorethylene. The drug was not so well tolerated. R.T.L.

(7n) Experimental data are presented which emphasize the importance of maintaining a given concentration of copper sulphate for as long as possible. It is suggested that the maintenance of low copper concentrations for an extended period may be more effective and less expensive than the high concentrations obtained by dissolving solid copper sulphate directly in canal water. In experiments with *Biomphalaria boissyi*, molluscan mortality was higher in tap-water than in natural water from sites favourable to molluscan colonization but this was not due to factors which removed the copper sulphate. R.T.L.

8—American Journal of Veterinary Research.

a. CAUTHEN, G. E., 1953.—" The effect of small daily doses of phenothiazine on the development of larvae of the gastrointestinal parasites of cattle." **14** (50), 30–32.
b. CAUTHEN, G. E., 1953.—" The toxic effect of phenothiazine on cattle of the Gulf Coastal Plain area of Texas, and its efficacy in removing *Ostertagia ostertagi* and *Trichostrongylus axei*." **14** (50), 33–34.
c. SINCLAIR, L. R. & ENZIE, F. D., 1953.—" Toluene against ascarids and bots in horses." **14** (50), 49–50.
d. KATES, K. C. & TURNER, J. H., 1953.—" Experimental studies on the pathogenicity of *Nematodirus spathiger*, a trichostrongylid parasite of sheep." **14** (50), 72–81.

(8a) Cauthen has studied the effect of small daily doses of phenothiazine on the development of larvae in faeces of cattle carrying mixed infections of trichostrongyles. The larval development in cultures from control animals was 60%; in those fed daily with 0·5 gm. of phenothiazine it was 13%, with 0·7 gm. it was 2·5%, with 1 gm. it was 0·9% and with 1·5 gm. it was 0·6%. R.T.L.

(8b) There are definite indications that gastro-intestinal helminthiasis in cattle is a much greater problem in the Gulf Coastal Plain area of Texas than in most other areas of the south. Phenothiazine produced sluggishness in those animals which received 125 gm. Results were fatal when severe anaemia was associated with nematode parasitism, and treatment with phenothiazine, except in very small doses, is inadvisable. Doses of 50 gm. and 60 gm. removed *Trichostrongylus axei* but were not large enough to eliminate *Ostertagia ostertagi*. 125 gm. removed a much higher percentage of *O. ostertagi* and produced only transitory toxic effects. R.T.L.

(8c) Toluene administered to horses in dosages of 10–20 c.c. per cwt. body-weight after a fast of 24 hours was well tolerated. All of five ascarids were removed from two horses but the drug had no significant action against strongyles. R.T.L.

(8d) Infective larvae of *Nematodirus spathiger*, totalling from 300,000 to 900,000, were administered to eight lambs in two doses over a period of three days, and to six lambs in nine doses over a period of four weeks. All the lambs were significantly retarded in growth as compared with the controls. The effect was most marked in those receiving the infective dose over the shorter period. By the end of the third week, they averaged about 7 lb. less in weight than the controls and later the difference approached 10 lb. per lamb. The pathogenic effects were similar to, but less acute than, those produced by *Trichostrongylus colubriformis*. The diarrhoea was most acute and of longer duration in the lambs dosed over the three-day period. It began during the second week and usually ceased before or after the egg count reached its peak. In those dosed over the four-week period, the diarrhoea was of shorter duration. By the end of the fourth week most of the lambs had recovered and resumed normal food consumption and weight gain. The number of eggs in the faeces declined and by the end of twelve weeks the faeces had become negative or nearly so. R.T.L.

9—Annales de Parasitologie Humaine et Comparée.

a. OSIMANI, J. J., MIGLIARO, E. F. & ABELLA, C. M., 1953.—" Etude expérimentale de l'action des ultrasons sur la larve d'*Echinococcus granulosus* (kyste hydatique)." **28** (1/2), 33–46.
b. MĂTIANU, T., 1953.—" Description d'une espèce nouvelle de gongylonème, *Gongylonema nitsulescui* du hérisson de Roumanie (*Erinaceus europeus romanicus* Barret-Hamilton 1900)." **28** (1/2), 47–59.
c. LAPIERRE, J., 1953.—" Un cas d'éosinophilie exceptionellement élevée au cours d'un taeniasis à *Taenia saginata*." **28** (1/2), 126.

(9a) Suspensions of fertile scolices from hydatid sand from pigs were submitted to ultrasonic waves of the intensity of 2·5 w./sq. cm. and the effects examined (i) microscopically and (ii) by inoculation of mice. The microscopical changes varied considerably. Some of the generative vesicles were ruptured and the scolices freed, while some of the scolices were rendered fragile and others showed reduced mobility. Inoculation of treated scolices produced fewer and smaller hydatid cysts as compared with untreated scolices. R.T.L.

(9b) *Gongylonema nitsulescui* n.sp. was collected from *Erinaceus europaeus romanicus* near Bucharest. The characteristic features of the new species are the presence of two cervical alae, the symmetrical arrangement of the cuticular bosses on both sides of the body and the width of the right caudal ala which is greatest in its anterior third. The number of known *Gongylonema* species (including one variety) is now 27, viz., three in primates, five in ungulates, eleven in rodents, two in insectivores and six in birds [but of these, one in ungulates and four in rodents are not yet specifically named]. R.T.L.

(9c) At Bamako in French West Africa a European resident with fever of obscure aetiology, giddiness, epigastric tenderness and an eosinophilia of 6% was treated with penicillin. The eosinophilia rose to 53%. The symptoms persisted and then gradually disappeared but the eosinophilia remained high. Faecal examinations during the succeeding two months were negative save for occasional evidence of whipworm infection. Three months after the illness commenced the eosinophilia was 36% and the patient passed Taenia segments. Male fern caused the evacuation of a complete *Taenia saginata*. The eosinophilia fell in eight days to 18% and in 15 days to 4%. R.T.L.

10—Annals of Applied Biology.

a. FENWICK, D. W., PETERS, B. G. & LIBBEY, R. P., 1953.—" Effects of repeated field injections of D-D mixture against potato-root eelworm." **40** (1), 208–214.
b. WINSLOW, R. D., 1953.—" Hatching responses in some *Heterodera* species." [Abstract of paper presented at meeting of the Association of Applied Biologists, December 5, 1952.] **40** (1), 225–226.

(10a) The authors investigated the effect of annual injection with D-D mixture for a period of three years on a silt and on a black fen soil. There was an increased yield of tubers on the former soil each year but the latter gave an increased yield only in the first year. The increased yield far outweighed the cost of D-D treatment on the silt but on the black fen D-D was ineffective in the second and third year, the eelworm population remaining at a level inducing eelworm failure. D.W.F.

(10b) Winslow describes the results of hatching tests with cysts of eight species of *Heterodera* exposed to various host and non-host root leachings. By the use of a sequence of root leachings he was able to cause the larvae of beet, cabbage and *Galeopsis* eelworms, in an artificial mixture of three infested soils, to hatch separately and so allow a quantitative estimation to be made of the species present as hatchable larvae. M.T.F.

11—Annals of Tropical Medicine and Parasitology.

a. FREER, P. M., 1953.—" Observations on the early fate of the microfilariae of *Litomosoides carinii* (Travassos, 1919), filarial parasite of the cotton rat, after their ingestion by the vector, *Bdellonyssus bacoti* (Hirst, 1913)." **47** (1), 13–25.
b. STANDEN, O. D., 1953.—" Experimental schistosomiasis. III.—Chemotherapy and mode of drug action." **47** (1), 26–43.
c. KERSHAW, W. E., 1953.—" The early migration-rate of the infective larva of *Litomosoides carinii* in the cotton rat." **47** (1), 68–73.
d. GORDON, R. M. & CREWE, W., 1953.—" The deposition of the infective stage of *Loa loa* by *Chrysops silacea*, and the early stages of its migration to the deeper tissues of the mammalian host." **47** (1), 74–85.
e. GRIFFITHS, R. B., 1953.—" Further observations on the penetration of mammalian skin by the cercariae of *Schistosoma mansoni*, with special reference to the effects of mass invasion." **47** (1), 86–94.
f. NICHOLAS, W. L., KERSHAW, W. E., KEAY, R. W. J. & ZAHRA, A., 1953.—" Studies on the epidemiology of filariasis in West Africa, with special reference to the British Cameroons and the Niger delta. III.—The distribution of *Culicoides* spp. biting man in the rain-forest, the forest fringe and the mountain grasslands of the British Cameroons." **47** (1), 95–111.

(11a) In a study of the events following the ingestion of the microfilariae of *Litomosoides carinii* of the cotton-rat by the vector *Bdellonyssus bacoti*, it was found that only about 4% developed to the infective stage. A comparison was made between smears and sections of

mites fed on infected cotton-rats. The presence of a great excess of empty sheaths over apparently sheathless microfilariae in the smears led to the adoption of a new technique in which blood was abstracted from an infected mite by pipette and mixed with an approximately equal amount of 0·6% Ringer's solution before it was gently smeared on a slide. The imperfect microfilariae seen in naturally infected mites were the effect of natural processes acting upon the microfilariae within a few hours of ingestion. Some microfilariae penetrated to the haemocoele within 24 hours of ingestion but a few remained unaltered in the lumen of the gut for six days before passing into the haemocoele. R.T.L.

(11b) There is still a great need for a new schistosomaticide, preferably to be given orally, and for more knowledge on the mode of drug action in schistosome infections. Standen records observations made in screening several hundred new compounds and at autopsies on about 12,000 mice and hamsters infected with *Schistosoma mansoni* cercariae from *Australorbis glabratus*. Hamsters proved the most suitable hosts for the production of eggs in large numbers. The greatest incidence of molluscan infection was obtained when the snails were exposed to six miracidia each. Snails of about 10 mm. in diameter, i.e. 10 to 14 weeks old, were used. Over 20,000 snails were infected in batches of fifty. Most batches showed a 100% infection in six weeks. The average mortality was 10%. Mice three weeks old proved most satisfactory. Each was exposed to 100–130 cercariae. When eight weeks later viable eggs were present in the faeces, the mice were ready for screening tests. Groups of 10 or 15 mice were given a five-day course of treatment and autopsied seven days after its completion. The doses were given intraperitoneally once daily or orally twice daily by stomach tube. In mice, *S. mansoni* are seldom found outside the liver until after the 26th day. Mating provides the stimulus for migration to the mesenteric veins. The drugs act first on the reproductive organs, then on the muscles. The worms cease to feed, the caecum loses its pigment and they are carried back into the liver where further degenerative changes take place. Liver tissue reaction is also the probable means by which affected worms are destroyed. The minimum dose levels required to produce hepatic shift of 75% or more female *S. mansoni* are tabulated. Should the drug fail to kill the worms, regeneration takes place. The worms return to the mesenteric veins and egg-laying recommences. R.T.L.

(11c) The tails of cotton-rats were slightly scarified and this area was exposed to the bites of mites infected with *Litomosoides carinii*. After intervals varying from 2½ hours to two days, the tails were cut off, and the time taken by the larvae to move between 4–8 cm. from the site of the bite towards the body of the cotton-rat was determined. This proved to be at least 4 cm. in a minimum of 18 hours. R.T.L.

(11d) Gordon & Crewe give an account of the feeding mechanism of *Chrysops* and the mode of escape of *Loa loa* larvae and demonstrate that the infective larvae were unable to penetrate pieces of unbroken human skin. *Chrysops*, on biting, produce beneath the skin a rapid and widespread haemorrhage of lenticular form which is prevented from clotting by a powerful anticoagulin in the salivary glands. It has a similarly powerful coagulin in the mid-gut. The larvae which may number up to 200 in the head and labium have never been observed in the labella. They apparently escape by penetrating the membrane at the base of the labium. R.T.L.

(11e) The differences in the observations of Gordon & Griffiths (1951) on the penetration of *Schistosoma mansoni* cercariae through the skin of mice [for abstract see Helm. Abs., **20**, No. 340a] and those reported by Standen (1952) [for abstract see Helm. Abs., **21**, No. 152d] are attributable to the use by Standen of far greater concentrations of cercariae. Using massive concentrations, Griffiths finds that although the stratum corneum may be extensively separated or lifted from the Malpighian layer, there is no obvious break or rolling back as described by Standen. Massive invasion tends to alter the pattern of penetration, to increase the rate of migration and sometimes to delay the discharge of glandular secretions by the cercariae. The massive exposures used in Standen's experiments represent an abnormal state. R.T.L.

(11f) Of the five species of *Culicoides* captured in the British Cameroons, *C. austeni*, *C. grahamii*, *C. inornatipennis* and *C. fulvithorax* were widespread in the rain forest zone. *C. grahamii* alone was caught in the mountain-grassland zone. *C. grahamii* and *C. inornatipennis* were the only species found in the zone of savannah with relict forest. Although the four species breed in rotting stems of banana and plantain they use the rain forest zone as alternative breeding sites. The extensive cultivation of bananas and plantains has probably increased the biting density of *C. austeni* near the villages. R.T.L.

12—Anzeiger für Schädlingskunde.

a. KOTTHOFF, P., 1953.—"Neuere Beobachtungen über das Auftreten von Nematoden." **26** (1), 12.

(12a) Kotthoff discusses one or two interesting cases of eelworm attack on crops. The first concerns the incidence of stem eelworm (*Ditylenchus dipsaci*) on rye grown in a field which in the previous year had carried on one part swedes, on another part beet, and on a third part a mixture of swedes and beet. Eelworm attack occurred mainly on the area cropped with swedes and to a lesser extent on that where swedes and beet had been mixed. Kotthoff concludes that the swedes served to maintain the eelworm already in the soil, the field having a previous history of stem eelworm infestation on rye; he recommends that brassicaceous roots should be avoided as rotational crops where stem eelworm of rye is present. The second case deals with cereal root eelworm (*Heterodera avenae*) on rye. A crop of summer rye in April 1952 showed many brown patches where the plants were stunted and the roots were short and branched; 14 days later the field, seen from a distance, looked normal but diseased patches were still easily recognized. After a heavy dose of nitrogen the plants were still shorter than normal and nematode cysts became visible though the nematode burden in the end was slight. Thirdly he reports the occurrence of root-knot (*Heterodera marioni*) on *Centaurea cyanus* and *Cirsium oleraceum* in a field carrying potatoes and rye but, in spite of careful search, he failed to find root-knot galls on the roots of the two crops. T.G.

13—Archivio Italiano di Scienze Mediche Tropicali e di Parassitologia.

a. GIROLAMI, M., 1953.—"L'eosinofilia midollare nella echinococcosi." **34** (2), 89–90.

(13a) The presence of medullary eosinophilia is of considerable value in the diagnosis of echinococcosis, particularly when peripheral eosinophilia is absent and when other conditions capable of producing eosinophilia, e.g., oxyuriasis, distomiasis, anaphylactic conditions etc. can be excluded. R.T.L.

14—Australian Journal of Agricultural Research.

a. STEWART, D. F., 1953.—"Studies on resistance of sheep to infestation with *Haemonchus contortus* and *Trichostrongylus* spp. and on the immunological reactions of sheep exposed to infestation. V. The nature of the 'self-cure' phenomenon." **4** (1), 100–117.

(14a) In this investigation into the nature and mechanism of self-cure in helminthiasis in sheep, it was found that there was no release of heterologous antibodies into the blood stream. On 7 out of 13 occasions when there was a self-cure reaction, the blood histamine level rose to about 0·05 μg. per ml. for 24 hours between the second and fourth day after the administration of larvae. On none of 13 occasions when the sheep failed to manifest self-cure did the blood histamine level rise. A rise in blood histamine occurred in sheep infected with either *Haemonchus contortus* or *Trichostrongylus* spp. when *H. contortus* larvae were given and there was a self-cure reaction. It also occurred in sheep infected with *Trichostrongylus* spp. following the administration of *Trichostrongylus* spp. larvae but not when sheep infected with *H. contortus* were given *Trichostrongylus* spp. larvae, and self-cure did not result. There was

o evidence that the increase in blood histamine was the direct cause of the self-cure or that iis increase was associated with any consistent change in the eosinophil concentration. In elf-cured sheep a strong local reaction to intradermal inoculation with *H. contortus* antigen ccurred. Continued infections with mature *H. contortus* or *Trichostrongylus* spp. did not ensitize and those sheep which failed to show self-cure did not exhibit an intradermal reaction.)n the day on which a rise in blood histamine followed the intake of *H. contortus* larvae there as an oedematous change in the mucous membrane of the abomasum in those sheep which arboured *H. contortus*, and in the mucosa of the small intestine of those sheep which harboured *richostrongylus* spp. R.T.L.

5—Australian Veterinary Journal.

a. SINCLAIR, D. P., 1953.—"An unsuccessful attempt to produce resistance to phenothiazine in *Trichostrongylus colubriformis* of sheep." **29** (1), 13–17.

(15a) The customary dose of 20 gm. of phenothiazine gives poor results against *richostrongylus* spp., the most widespread pathogenic nematodes of young sheep in New ealand. This dosage has been based on the reduction of egg counts and ignores the depressing fect on egg production. Attempts to produce phenothiazine-resistant strains gave completely egative results. R.T.L.

6—Berliner und Münchener Tierärztliche Wochenschrift.

a. LIEBMANN, H., 1953.—" Über die Verwendung proteolytischer Fermente zur Bekämpfung der Nematoden der Haustiere." **66** (2), 17–22.
b. HEPDING, L., 1953.—"Anthelminthische und toxikologische Untersuchungen mit dem Anthelminthicum 'Evultin'." **66** (4), 53–56.

(16a) Liebmann points out that treatment for intestinal helminths in domestic animals ould aim at destroying the worms without affecting the intestinal flora. Proteolytic enzymes e worthy of consideration since they comply with these conditions. *In vitro* experiments are escribed in which *Toxocara canis*, *Strongylus vulgaris*, *Dictyocaulus filaria*, *Protostrongylus fescens*, *P. nigrescens*, *Haemonchus contortus* and *Heterakis gallinae* were placed in 2% to 4% spensions of "Vermizym". In every case digestion and perforation of the cuticle was llowed by gradual maceration and dissolving of the worm. The paper is illustrated with any photographs. A.E.F.

(16b) Hepding reports that "Evultin" (propionic acid-*p*-tertiary amyl phenol ester) is ficacious against *Toxascaris leonina* and *Toxocara canis* in dogs, *Toxocara cati* and *Ancylostoma ninum* in cats, ascarids in silver foxes, and ascarids, Heterakis and Capillaria in fowls. It is ministered in gelatine capsules. The optimum doses were (gm. per kg. body-weight): gs, 0·1 to 0·2; cats, 0·2; silver foxes, 0·25; fowls, 0·8 to 1·5. The therapeutic dose was in ery case well tolerated. A.E.F.

—Biological Reviews of the Cambridge Philosophical Society.

a. MANN, K. H., 1953.—" The segmentation of leeches." **28** (1), 1–15.

(17a) Mann considers that the neurosomic theory of metamerism in leeches (in which e limits of the segments are determined by the distribution of the segmental nerves) affords e simplest explanation of (i) the progressive reduction in the number of annuli in each gment from the middle towards both extremities of a leech, and of (ii) the relation of the rves and segments in the head of *Haemopis sanguisuga*. The continuous trend towards reasing subdivision of the annuli makes an increase in flexibility and capacity for extension ssible, although the number of segments remains constant. R.T.L.

18—British Medical Journal.

a. HAYES, I., 1953.—" Treatment of threadworms." [Correspondence.] Year 1953, **1** (4808) 510–511.
b. LEWIS, C., 1953.—" Dogs and disease." [Correspondence.] Year 1953, **1** (4813), 781.
c. MAC KEITH, R., 1953.—" Treatment of threadworms." [Correspondence.] Year 1953 **1** (4814), 837.
d. MAY, F., 1953.—" Treatment of threadworms." [Correspondence.] Year 1953, **1** (4820), 1166

(18a) In patients suffering from threadworm, often pregnant women and children, the diet was low in protein and high in carbohydrate as compared with that of the general population. By altering the diet so as to decrease the carbohydrate and starch and increase the protein and fat, a complete cure consistently followed in about two weeks and relapses did not occur while this type of diet was maintained. Hayes enquires if threadworm has become more prevalent in Great Britain since the reduction in the consumption of meat or has adequate protein been replaced from other sources. R.T.L.

(18b) As it was stated recently in the House of Commons that there was little evidence that domestic dogs were commonly responsible for any human disease in Britain, Lewis points out that human cases of hydatid disease are not infrequent in South Wales, especially in the industrial counties of Glamorgan and Monmouth, and that the Registrar-General's statistical reports for the last 10 years reviewed showed an average of 17 deaths annually. Although regulations control the disposal of offal in abattoirs little effort has been made to warn the public of the danger to children in city parks which are fouled by pet dogs. Lewis quotes a recent case of intracranial hydatid cyst from a Cardiff hospital. R.T.L.

(18c) Mac Keith replying to Hayes [see No. 18a above] doubts if oxyuriasis in children is associated with hunger, especially for sweets and sugar. He points out that rationing of protein has resulted in changes in distribution rather than in total consumption. R.T.L.

(18d) May cites an instance of complete elimination of *Enterobius vermicularis* in a patient suffering from rheumatoid arthritis and sinusitis who received a course of aureomycin. R.T.L.

19—Bulletin Mensuel de la Société Linnéenne de Lyon.

a. JOYEUX, C. & BAER, J. G., 1953.—" Sur quelques helminthes de la région de Gannat (Allier)." **22** (1), 25–32.

(19a) A species of *Gorgoderina* found in 20 out of 34 adult specimens of *Bombina salsa* is provisionally identified as *G. vitelliloba*. The larval development probably occurs in *Sphaerium corneum*. This appears to be the first record of *G. vitelliloba* in France and the first in this host. *Diplostomulum phoxini* is briefly described; attempts to infect *Tropidonotus viperinus*, hens, ducks, rats, mice and kittens to find the definitive host were unsuccessful. It is estimated that 25% of the sheep in the Gannat region are infected with lungworms. R.T.L.

20—Bulletin de la Société de Pathologie Exotique.

a. LE GAC, P., SAUERMANN, M. & N'KOA, A., 1953.—" Mise en évidence pour la première fois en Oubangui-Chari de *Schistosoma intercalatum* (Fisher, 1934)." **46** (1), 15–16.
b. GUILLON, P., 1953.—" Sur un syndrome hématologique complexe avec splénomegalie dû à la trichocéphalose." **46** (1), 39–43.
c. CASILE, M. & SACCHARIN, H., 1953.—" L'intradermo-réaction dans la filariose de Bancroft en Guyane française." **46** (1), 137–144.
d. BEYE, H. K., KESSEL, J. F., HEULS, J., THOORIS, G. & BAMBRIDGE, B., 1953.—" Nouvelles recherches sur l'importance, les manifestations cliniques, et la lutte contre la filariose à Tahiti, Océanie française." **46** (1), 144–163.

(20a) *Schistosoma intercalatum* is now reported for the first time from the dispensary at Bangui, Oubangui-Chari, where urinary schistosomiasis is unknown. The terminal-spined eggs were present in the diarrhoeic faeces of a girl aged 2½ years who had never left the district. No eggs were found in the centrifuged urine. *Physopsis* were plentiful in the numerous ponds in the neighbourhood, but *Bulinus* were absent. R.T.L.

(20b) Clinical and haematological details are given of a case in which splenomegaly and an infection with *Trichuris trichiura* were associated. In the subsequent discussion, L. Brumpt considered that the association was quite fortuitous. R.T.L.

(20c) An antigen prepared from *Dracunculus medinensis* at the Pasteur Institute proved more reliable than microscopical examination of the blood for microfilariae in confirming the clinical diagnosis of filariasis. Of 22 urogenital cases, 59% had microfilariae and 72·7% were positive to the antigen. Of eight cases with glandular syndromes only two had microfilariae but all gave the intradermal reaction. Of six cases with lymphangitis of the lymph vessels, all were positive to microscopical examination; one was negative to antigen. Of eight cases of capillary lymphangitis of the pseudo-erysepelous type, seven were negative and one was positive to both tests. None of eight cases of elephantiasis had microfilariae and only one gave a positive intradermal reaction. The intradermal reaction could be profitably utilized to determine filarial incidence in an endemic area and to clarify the filarial origin of elephantiasis and certain types of endemic lymphangitis. R.T.L.

(20d) In this study of clinical filariasis in 15 districts of Tahiti and some of the French Islands of Oceania, 32% of 8,537 individuals were found to have microfilariae in their blood. *Dirofilaria immitis* antigen gave a positive response in 70% of the Tahitians. When hetrazan was administered for seven days, at the rate of 2 mg. per kg. body-weight thrice daily, 6·7% still showed microfilariae two days after the course was completed. Microfilariae were present in 50% after one year and in 56% after two years. A group of 233 persons, all of whom had microfilariae, received a course of hetrazan; 41% were still positive one year later and 29% were still positive one year after a second course of treatment with hetrazan. [In the bibliography at the end of this paper, an early communication by the authors is cited from the *Amer. J. trop. Med.*, 1950, "in press". The paper actually appeared in *Amer. J. trop. Med. Hyg.*, 1952, **1** (4), 637–661. For abstract see Helm. Abs., **21**, No. 176a.] R.T.L.

21—Bulletin de la Société Zoologique de France.

a. TIMON-DAVID, J., 1953.—" Un *Renicola* nouveau chez la pie. *Renicola bretensis*, nov.sp. (Trematoda, Renicolidae)." **77** (5/6), 504–511.

(21a) For the first time a passeriform bird has been found to be a host of a species of *Renicola*. The new host is *Pica pica*, from Provence. The parasite, named *Renicola bretensis* n.sp., is easily differentiated from known species by the large dimensions of the stout oral sucker and by the small size of the ventral sucker which is very weak and only slightly concave. Especially characteristic is the presence of a large intestinal pouch formed by the fusion of the anterior portions of the caeca. The yolk glands in this species do not extend into the posterior third of the body. The relative sizes of oral and ventral suckers is 1:5·3 as compared with a maximum of 1:3·6 in other *Renicola* species. The pathological lesions are briefly described. R.T.L.

22—California Agriculture.

a. RASKI, D. J., ALLEN, M. W. & BURTON, V. E., 1953.—" Nematode on cotton. Root-knot nematode control by soil fumigation profitable in Kern County." **7** (4), 8, 13.

(22a) Larval root-knot nematodes do not travel long distances in the soil, in spite of a heavy infection in the surrounding soil. A young cotton plant will therefore grow well if the area in which it is planted has been fumigated with D-D mixture. When the plantings are in rows about 38 inches apart, the amount of fumigant required for row treatment can be reduced by two-thirds of that needed for the whole area. Data are cited to show that while the increased value of the crop was far greater than the cost of fumigation, flat treatment of the whole area was much more effective. To avoid excessive soil disturbance and phytotoxicity, fumigation should be done when the beds are being formed and not at the planting time. R.T.L.

23—Canadian Entomologist.

a. BAKER, A. D., 1953.—" Rapid method for mounting nematodes in glycerine." **85** (2), 77–78.

(23a) In Baker's method the nematodes are killed by gentle heat in the usual manner and fixed overnight or longer in 5% formol, or in some other formol fixative. They are transferred to lactophenol at about 65°C. and, if desired, they may be stained at this stage. They are then transferred for ten minutes at a time to each of five mixtures of lactophenol with increasing proportions of glycerin added, plus 5% formol in each case, all at a temperature of about 50°C. The final mixture contains 90% glycerin and may be placed in a desiccator or replaced by pure glycerin. The nematodes are then mounted as usual. M.T.F.

24—Canadian Journal of Zoology.

a. WOLFGANG, R. W., 1953.—" *Pseudocruzia* (Oxyuroidea: Kathlaniidae) a new genus of nematode from domestic swine in India." **31** (1), 16–19.

(24a) As *Cruzia orientalis* Maplestone, 1930 which occurs in pigs in India differs from other species of the genus *Cruzia* in having interstomal papilliform processes, greatly inflated lips and a wide stomal opening, Wolfgang has made it the type of *Pseudocruzia* n.g. Maplestone's original specimens are redescribed and figured. R.T.L.

25—Deutsche Tierärztliche Wochenschrift.

a. WETZEL, R., 1953.—" 60 Jahre Parasitologie." **60** (1/4), 15–20.
b. ENDREJAT, E., 1953.—" Eine Rückschau auf Forschung und Bekämpfung der wichtigsten Schafkrankheiten in Deutschland in den letzten 60 Jahren." **60** (1/4), 32–35.
c. KELLER, H., 1953.—" Beitrag zur Entwicklung der tierärztlichen Nahrungsmittelkunde mit besonderer Berücksichtigung der letzten 60 Jahre." **60** (1/4), 42–46.
d. NICKEL, E. A., 1953.—" Der Haarwurmbefall der Hühner und seine Bekämpfung." **60** (5/6), 71–77.
e. ENIGK, K., 1953.—" Die Bodendesinfektion mit Methylbromid." **60** (11/12), 131–132.

(25a, b, c) These three papers form part of a series summarizing developments in veterinary medicine during the 60 years' existence of the *Deutsche tierärztliche Wochenschrift*, especially as reflected in papers published in the journal itself. Wetzel deals with veterinary parasitology generally, Endrejat with diseases of sheep (including helminth infections), and Keller includes in his survey of the veterinary aspects of food control an account of the development of Trichinella inspection. A.E.F.

(25d) Nickel describes the principal *Capillaria* spp. (*C. annulata*, *C. caudinflata*, *C. retusa*, *C. columbae* and *C. collaris*) of the domestic fowl and gives an account of their bionomics and pathology. Light infections do not produce clinical symptoms in young birds. Emphasis should be laid on the prevention of serious infections by adequate feeding and hygiene—birds should be kept in clean, dry and sunny enclosures in which earthworms are destroyed by applications of a contact insecticide. Although phenothiazine was well tolerated, even in repeated doses of from 0·5 to 0·75 gm. per kg. body-weight, it was not effective against Capillaria. Nickel was unable to confirm the favourable results obtained by other workers from treatment with Egalon, a gentian violet preparation. A.E.F.

(25e) Enigk's experiments with methyl bromide as a soil fumigant for destruction of Ascaris and hookworm ova, hookworm larvae and coccidia oocysts have proved successful. On a two-square-metre plot, 200 c.c. methyl bromide was applied and all worms, larvae and oocysts were destroyed to a depth of 30 cm.; 80% were destroyed at 40 cm., and 60% at 50 cm. Owing to the high cost of methyl bromide and to the fact that a gas-proof covering has to be placed over the treated soil, this method can only be used for very limited areas. A note added while the paper was going through the press states that similar experiments with D-D mixture were entirely unsuccessful. A.E.F.

26—Dokladi Akademiij Nauk SSSR.

a. CHECHINA, A. C., MALEVITSKAYA, M. A. & KONONOVA, N. E., 1953.—[Influence on acclimatization of *Ameiurus nebulosus* and its parasites.] **88** (1), 173–175. [In Russian.]
b. GINETSINSKAYA, T. A., 1953.—[Importance of the colour of sporocysts of the genus *Leucochloridium* for the specific diagnosis.] **88** (1), 177–179. [In Russian.]
c. LOGACHEV, E. D., 1953.—[Development of oocytes and importance of yolk nuclei in *Raillietina urogalli* Modeer.] **88** (1), 181–184. [In Russian.]
d. DOTSENKO, T. K., 1953.—[Life-cycle of *Cheilospirura hamulosa*, parasite of gallinaceous birds.] **88** (3), 583–584. [In Russian.]
e. BELOPOLSKAYA, M. M. & USPENSKAYA, A. V., 1953.—[Some data about the life-cycle of *Spelotrema arenaria* n.sp.] **89** (3), 581–583. [In Russian.]
f. ROMAN, E., 1953.—[Contribution to the parasitic fauna of *Lepomis gibbosus* (L.), acclimatized in Danube.] **89** (4), 765–768. [In Russian.]

(26a) The authors examined 46 specimens of *Ameiurus nebulosus*, which was introduced into the lakes of eastern Poland during the years 1930 to 1940 from the U.S.A., and found them to be infected with *Ancyrocephalus pricei* and *Diplostomulum spathaceum*. They conclude that *A. pricei* is the only parasite which has become acclimatized and that *D. spathaceum* has been acquired in the new habitat. C.R.

(26b) Ginetsinskaya examined 2,850 *Succinea elegans* and found 37 of them infected with *Leucochloridium* sporocysts of six different colours. Three of the colours are new, coffee-coloured with white spots, yellow-brown, and grey-greenish. She discusses the various sporocyst colours described by other authors and thinks that colour is a specific character in *Leucochloridium*. C.R.

(26c) Logachev, in this cytological study of the ovary of *Raillietina urogalli*, discusses the development and importance of yolk nuclei from fatty substances. C.R.

(26d) In this study of the life-cycle of *Cheilospirura hamulosa*, Dotsenko found that *Oedaleus infernalis* acts as its intermediate host under natural conditions. Experimentally, he was able to infect the following intermediate hosts: *Tetrix japonica*, *Aiolopus* sp., *Phaneroptera falcata*, *Gampsocleis sedakowi* and *Decticus verrucivorus*. The larvae hatch in the intestine of the intermediate host in five to seven hours and during the first twenty-four hours they migrate into the body-cavity. They moult twice, on the tenth and sixteenth days respectively. On the twentieth day the larvae reach the third stage and penetrate into the muscles of the insect where they become coiled and infective. When fed to hens they penetrate under the cuticle of the gizzard and during the following twenty-four days undergo two moults. On the thirty-fifth day they penetrate into the muscles of the gizzard and, 120 days after infection, produce eggs. C.R.

(26e) *Spelotrema arenaria* n.sp. from the intestine of *Arenaria interpres* differs from other species of the genus by the form of the male papilla. The metacercaria is described from the body-cavity of the crustacean, *Amphithoe rubricata*. When the metacercariae were fed to worm-free chicks of *Larus argentatus* and *Fratercula arctica* they developed to maturity in three days. C.R.

(26f) Roman examined 32 specimens of *Lepomis gibbosus* (imported from America) from the Rumanian part of the Danube. He found that two species of trematodes belonging to the American fauna still persisted, namely, *Urocleidus dispar* and *U. similis*. C.R.

27—Experimental Parasitology. New York.

a. KARTMAN, L., 1953.—"Factors influencing infection of the mosquito with *Dirofilaria immitis* (Leidy, 1856)." **2** (1), 27–78.
b. SCOTT, J. A. & MACDONALD, E. M., 1953.—" Experimental filarial infections in cotton rats." **2** (2), 129–140.
c. BULLOCK, W. L., 1953.—" Phosphatases in experimental *Trichinella spiralis* infections in the rat." **2** (2), 150–162.
d. LEVINE, N. D. & IVENS, V., 1953.—" Relation of chemical structure to activity of iodine compounds against the developmental stages of horse strongyles." **2** (2), 163–169.

e. MACDONALD, E. M. & SCOTT, J. A., 1953.—" Experiments on immunity in the cotton rat to the filarial worm, *Litomosoides carinii*." **2** (2), 174–184.
f. GAAFAR, S. M. & ACKERT, J. E., 1953.—" Studies on mineral deficient diets as factors in resistance of fowls to parasitism." **2** (2), 185–208.

(27a) The host efficiency of *Aëdes albopictus* for *Dirofilaria immitis* was twenty times better and its infective potential fifty times greater than that of *A. aegypti*. Both the host efficiency and the infective potential of *Culex quinquefasciatus* were two-and-a-half times greater than for *C. pipiens*. The host and parasite reactions of geographical strains of *A. aegypti* from the U.S.A., South Africa and the Anglo-Egyptian Sudan were similar but a Hawaiian strain was more susceptible and a Fijian strain was more refractory to infection with *D. immitis*. When *D. immitis* and *Foleyella brachyoptera* were fed simultaneously or at intervals to *A. aegypti*, each species of filaria reached its normal site of development with no apparent mutual antagonism and their subsequent development was typical for the species. Artificial selection resulted in the establishment of susceptible and refractory strains. All the microfilariae of *D. immitis* in the midguts of *Culex quinquefasciatus*, *C. pipiens* and their reciprocal hybrids were killed and digested in 24 to 48 hours. In *Anopheles quadrimaculatus* and *A. freeborni* some of the microfilariae remained alive for over 72 hours, and in *Aëdes aegypti* and *A. albopictus* for at least 48 hours. The rapid formation of blood clots in the midgut mechanically inhibited the migration of *D. immitis* microfilariae into the Malpighian tubules in the *Aëdes* species but not in the *Anopheles* species. In 24 hours the average number of microfilariae in the Malpighian tubules of *Aëdes* was only 45% whereas the average in the *Anopheles* was 91%. The number of ingested microfilariae varied with the microfilarial periodicity in the dogs' blood. The maximum was ingested by *Aëdes aegypti* between 6 p.m. and 10 p.m. and the minimum between 6 a.m. and 10 a.m. R.T.L.

(27b) Semi-quantitative infections of *Litomosoides carinii* can be obtained by dissecting out the infective larvae from *Bdellonyssus bacoti* in Tyrode's solution of half strength and transferring counted numbers of them to subcutaneous pockets made by incision in the skin of cotton-rats. The larvae cannot escape from intact mites. Infection does not take place by the mouth or stomach. Migration of the larvae from the skin to the pleural cavity occurs within a few days. Most larvae migrate equally quickly from the abdominal cavity but a few may remain there and develop normally. R.T.L.

(27c) The muscle fibres of rats invaded by Trichinella undergo basophilic granular degeneration within one or two days and alkaline phosphatase activity is observable four to five days after the invasion. It is marked in the eosinophils associated with perivascular infiltration and in those present around young or degenerating parasites. No clear evidence was obtained that the alkaline enzyme played a role in calcification or that the phosphatase of the degenerating muscle played any role in the physiology. As no important amount of phosphatase occurs in normal adult striated muscle, its origin, nature and function in infected tissue are obscure. This is one of the first accounts of phosphatase activity in degenerating tissue. R.T.L.

(27d) Levine & Ivens, in summarizing their work on the effect of iodine compounds on the developmental stages of horse strongyles in faeces, state that their toxicity is closely related to the availability of the iodine atom. Iodine compounds lethal at a concentration of 0·0005 M. or less are iodic acid, periodic acid, the iodides of barium, cadmium, calcium, lithium, strontium, zinc, plumbous iodide, trimethylene iodide and pentamethylene iodide. Of 16 alkyl monoiodides, those *n*-alkyl iodides with five or less carbon atoms were inactive at a concentration of 0·01 M. The most toxic was *n*-octyl iodide (0·0025 M.). The three alpha-omega diiodides, ethylene iodide, trimethylene iodide and pentamethylene iodide, were much more active than their related *n*-alkyl monoiodides. R.T.L.

(27e) The principal effects of the immunity to *Litomosoides carinii* shown by the cotton-rat are: (i) an overwhelming of the larval stages passing through tissues, (ii) a reduction in the number of worms which develop in immune as compared with control animals, due to

failure of growth of the larval stages in the intestine or to the death of developing worms, and (iii) a growth-rate retardation. This occurs to a still greater degree in the white rat. A precipitate forms at the oral and other openings of *L. carinii* larvae when placed in immune serum. R.T.L.

(27f) When about 200 eggs of *Ascaridia galli* were given per fowl to different groups the worms from those kept on a diet deficient in phosphorus were fewer and shorter, while in those kept on a diet deficient in calcium the worms were fewer and smaller than in the controls. These results provide the first experimental evidence of the phosphorus and calcium requirement for the normal growth of a nematode. The hens on the phosphorus-deficient diet showed symptoms of general debility and those on the calcium-deficient ration showed retarded growth, pliable beaks and, frequently, rickets. The evidence as to manganese was inconclusive. Resistance of growing chickens to *Ascaridia galli* did not appear to be affected by phosphorus or calcium deficiency in their diet. R.T.L.

28—FAO Plant Protection Bulletin. Rome.

a. MILLER, P. R. & SASSCER, E. R., 1953.—" Plant diseases and insects in the United States." **1** (4), 56–57.
b. MILLER, P. R., 1953.—" Plant disease situation in the United States." **1** (5), 69–71.

(28a) Heavy infection with *Heterodera cruciferae*, hitherto known to occur only in England and Wales, has now been found in many fields near Half Moon Bay in San Mateo County, California, where cruciferous crops, especially brussels sprouts, have been grown commercially for many years. R.T.L.

(28b) Large populations of a species of *Pratylenchus* were present in the roots of badly deteriorated sugar-cane plants, variety C.P. 44/101, from a Louisiana field affected with *Sclerospora* sp. The relation of the eelworm to the *Sclerospora* disease was not ascertained. R.T.L.

29—Hawaii Medical Journal.

a. ALICATA, J. E., 1953.—" Human fascioliasis in the Hawaiian Islands." **12** (3), 196–201.

(29a) Alicata summarizes the published reports of 19 cases of fascioliasis in man in the Hawaiian Islands and adds notes on three further cases. Of these, one had died of massive infection of the liver which had caused suppurative cholangitis, liver abscesses and diffuse hepatic necrosis. The second case had been operated on for partial obstruction of the common bile duct; the third case, with a history of indisposition, nausea, vomiting, chills and fever of one month's duration, had coughed up a fluke in hospital. In these three cases the fluke was identified by Alicata as *Fasciola gigantica* and he is of the opinion that two of the cases already recorded were due to *F. gigantica*. *F. hepatica* and *F. gigantica* are both known to be present in cattle in the Hawaiian Islands. The flukes were located in the liver in four cases, in the peritoneal cavity in five cases, in the respiratory passages in four cases, in the aural canal in one case and in the skin in two cases. In three cases the location was not reported. R.T.L.

30—Indian Veterinary Journal.

a. RAMAKRISHNAN, M. & ANANTHAPADMANABHAN, K., 1953.—"A preliminary note on the investigation into bovine paralysis in South Kanara District, Madras State." **29** (4), 291–303.
b. RAO, M. V. K., 1953.—" The economic importance of deworming sheep." **29** (4), 310–321.
c. RAMANUJACHARI, G. & ALWAR, V. S., 1953.—" Indian pig (*Sus scrofa domestica*) as a host for *Onchocerca* sp. and *Enterobius vermicularis*." **29** (4), 329.

(30a) An investigation into bovine paralysis in South Kanara failed to detect any protozoan, bacterial or virus cause for the disease but as microfilariae were present in the peripheral blood of 3 out of 50 cattle, it is suggested that the condition might be found to resemble the lumber paralysis of goats in Ceylon if the brain and spinal cord were subjected to histopathological examination. R.T.L.

(30b) In Madras State there is a population of 4½ million woolly sheep and 6 million mutton sheep. Verminous infection is one of the most important factors affecting their growth and development. Many of the Government's stud rams distributed to shepherds for breeding purposes have died of heavy parasitic infections. A series of demonstrations of the method of drenching with phenothiazine were held at three centres in different parts of Madras State and the economic importance of de-worming sheep was illustrated by weighing the treated and control sheep. R.T.L.

(30c) Pieces of female *Onchocerca* sp. were found in atheromatous lesions on the endothelial surface of the aorta of a pig. A living female *Enterobius vermicularis* was recovered from the colon of another pig. Both animals had been slaughtered in Madras. This is the first occasion on which *Onchocerca* and *Enterobius* have been recorded in this host. R.T.L.

31—Journal of the American Veterinary Medical Association.

a. ENZIE, F. D., FOSTER, A. O., SINCLAIR, L. R. & COLGLAZIER, M. L., 1953.—" Trials with di-phenthane-70 on the sheep tapeworm, *Moniezia expansa*." **122** (910), 29–30.
b. PRCHAL, C. J., 1953.—" Postmortem condemnations resulting from migratory ascarids in hogs." **122** (910), 42–44.
c. KOUTZ F. R. & GROVES, H. F., 1953.—" *Strongyloides stercoralis* from a dog in Ohio." **122** (912), 211–213.
d. PRICE, D. A. & HARDY, W. T., 1953.—"Activity of certain drugs against the fringed tapeworm." **122** (912), 216–220.
e. SUSSMAN, O., 1953.—" State problems in the control of garbage-borne diseases." **122** (914), 354–356.

(31a) Di-phenthane-70 was only partially effective as a taeniacide for *Moniezia expansa* in sheep. Detailed results from doses of 4·5 gm. to 15 gm., i.e. from 0·5 gm. per 6 lb. bodyweight to 0·428 gm. per pound, are tabulated. The drug was well tolerated at the lower dose rates but a 15 gm. dose proved toxic. R.T.L.

(31b) The migration of Ascaris into the bile duct frequently follows the movement of pigs from farm to slaughterhouse when the distances are long and the feeding on the journey is inadequate. Icterus results from the plugging of the biliary ducts and is accompanied by cholangitis or hepatitis and is most pronounced in the eyes, skin and fatty tissues due to the deposition of bile pigments. Between March 1948 and April 1952, 7,848 livers invaded by ascarids were seen and 511 of the carcasses were icteric. The practice of feeding a minimum of 200 lb. of grain per car deck carrying about 65 pigs at regular feeding, watering and resting stations would contribute to a lowering of the incidence of roundworm migrations. R.T.L.

(31c) Although between 2,500 and 3,000 faecal samples from dogs and cats are examined yearly at the Ohio State Veterinary Clinic, this is the first definite report of the occurrence of *Strongyloides stercoralis* in a dog in Ohio. Its faeces showed also ova of *Ancylostoma caninum* and *Trichuris vulpis*. There was a long history of severe persistent diarrhoea. On necropsy there were areas of consolidation and petechial haemorrhages throughout the lungs and a severe haemorrhagic enteritis in the entire intestinal tract. R.T.L.

(31d) The effectiveness and optimum dosages of *bis* (5-chloro-2-hydroxyphenol) methane against *Thysanosoma actinioides* in sheep reported by Ryff *et al.* [for abstracts, see Helm. Abs., **18**, No. 212b, **19**, No. 327b] are confirmed but as in some cases there were severe toxic effects, scouring and inappetence it should be used with caution. The authors used 2,2′-methylene-*bis* (4-chlorophenol) with which it is said to be synonymous and is an active ingredient of certain commercial preparations (e.g. Teniatol and di-phenthane 70). R.T.L.

(31e) Sussman discloses the ineffectiveness of the federal regulations in the U.S.A. for the control of garbage-borne diseases of pigs. In New Jersey which is one of the prime producers of raw-garbage-fed, trichina-infected pigs and pork, about 75% of the raw garbage is imported from New York and Pennsylvania and is fed raw in contravention of the U.S.A.

Public Health Service Interstate Quarantine Regulation. Pigs fed on raw garbage are also imported from other States without restriction and inspected raw pork is moved in with impunity. Sussman points out that the continued movement into New Jersey of trichina-infected pigs and pork bearing a federal stamp of approval nullifies the garbage controls instituted within the State. R.T.L.

32—Journal of the Marine Biological Association of the United Kingdom.

a. HUTTON, R. F., 1953.—"*Cercaria reesi* n.sp., a new furcocercous larva from Plymouth." **31** (3), 581–585.

(32a) *Cercaria reesi* n.sp. which develops in sporocysts in the marine bivalves, *Hiatella arctica* and *H. striata*, in Plymouth Sound, is nonoculate, longifurcous and pharyngeate. It resembles *C. myae* and *C. discursata* and, like them, possesses two pairs of penetration glands anterior to the ventral sucker. This places these three cercariae in Wesenberg-Lund's Strigea group. *C. reesi* is distinguished, however, by the presence of two pairs of anterior penetrating spines and in having cuticular tubercles on the oral and ventral suckers. Thirty-five marine furcocercous cercariae have hitherto been recorded but many are very poorly described and may not be specifically distinct. R.T.L.

33—Journal of Parasitology.

a. VAN CLEAVE, H. J., 1953.—"A preliminary analysis of the acanthocephalan genus *Corynosoma* in mammals of North America." **39** (1), 1–13.
b. VAN DER WOUDE, A., CORT, W. W. & AMEEL, D. J., 1953.—" The early development of the daughter sporocysts of the Strigeoidea (Trematoda)." **39** (1), 38–44.
c. MARKELL, E. K., 1953.—" *Nagmia floridensis*, n.sp., an anaporrhutine trematode from the coelom of the sting ray *Amphotistius sabinus*." **39** (1), 45–51.

(33a) In this preliminary report diagnoses are given of nine clearly defined species of *Corynosoma* found in North American mammals. Of these, five are new. *C. validum* n.sp., from the Pacific walrus (*Odobenus divergens*), differs from all other species of *Corynosoma* in body shape which shows marked sexual dimorphism and in the absence of a basal enlargement of the cylindrical proboscis. *C. villosum* n.sp. from Steller's sea lion (*Eumetopias jubata*) differs in general shape and size of body and in size and armature of the proboscis. *C. cameroni* n.sp. from the white whale (*Delphinapterus leucas*) is characterized by the shape of the short thick-set body, the larger size and number of proboscis hooks. *C. hadweni* n.sp. from the grey seal (*Halichoerus grypus*) resembles *C. strumosum* and *C. reductum* but differs in size, shape and proportions of the body, the size of the proboscis and the number and sizes of the hooks. *C. falcatum* n.sp. from the grey seal differs from all other species of the genus in the number and peculiar shape of the proboscis hooks and in deformity of the basal hooks in each row. R.T.L.

(33b) Further details on the structure of the germinal masses and on their development in daughter sporocysts are now added to earlier contributions on the germinal development of the Strigeoidea by observations on the germinal masses of *Diplostomum flexicaudum* in natural infections in *Stagnicola emarginata angulata* and in experimental infections in *S. palustris elodes* and of *Cercaria modicella* from naturally infected *Fossaria abrussa*. The development of the germinal masses from the germinal cells in the daughter sporocyst is not synchronous and thus is adapted to produce cercariae over lengthy periods. The mother sporocyst can continue to produce daughter sporocysts until the digestive gland is full and the daughter sporocysts are apparently able to produce cercariae throughout the life of the infected snail. R.T.L.

(33c) *Nagmia floridensis* n.sp. from *Amphotistius sabinus* from the west coast of Florida is described and figured. It is differentiated from *N. yorkei* by a longer oesophagus and less sacculated caeca, smaller testis follicles, the shape and position of the ovary which in *N. yorkei* is lobed and to one side of the midline. It differs also from *N. pacifica* which apparently lacks an oesophagus, has only rudimentary caecal sacculations and has larger and fewer testis

33—Journal of Parasitology (cont.)

d. LOVE, G. J., WILKIN, S. A. & GOODWIN, Jr., M. H., 1953.—" Incidence of blood parasites in birds collected in southwestern Georgia." **39** (1), 52–57.
e. LOCKER, B., 1953.—" Parasites of bison in northwestern U.S.A." **39** (1), 58–59.
f. BURNS, W. C. & PRATT, I., 1953.—" The life cycle of *Metagonimoides oregonensis* Price (Trematoda: Heterophyidae)." **39** (1), 60–69.
g. KERR, K. B. & GREEN, H. E., 1953.—" The taeniacidal activity of seven halogenated diphenyl methanes, a diphenyl propane and a diphenyl ether." **39** (1), 79–83.
h. HUNTER, W. S. & VERNBERG, W. B., 1953.—" *Pseudospelotrema ammospizae* sp.nov., (Trematoda: Microphallidae) from the seaside sparrow *Ammospiza maritima macgillivraii* (Audubon)." **39** (1), 84–87.

follicles. Johnston (1934) and Caballero (1945) both rejected *Nagmia* as a synonym of *Petalodistomum* but Markell points out that in the latter genus the vitellaria are very close to the ovary and seminal receptacle while in Nagaty's figure of *N. yorkei* the right vitellarium and in *N. floridensis* and *N. pacifica* both vitellaria, are well lateral in position with long ducts to the reservoir. He therefore retains *Nagmia* as a distinct genus. *Petalodistomum pacificum* is transferred to *Nagmia* as *N. pacifica* (Caballero) n.comb. Outline figures are given of the Anaporrhutinae genera, *Anaporrhutum*, *Plesiochorus*, *Probolitrema*, *Staphylorchis*, *Petalodistomum* and *Nagmia*. R.T.L.

(33d) In this survey of the blood parasites of birds in south-western Georgia made primarily in connection with studies of the susceptibility of *Anopheles* to avian malarias, the incidence of microfilariae is recorded. It is noted that microfilariae were detected four times as frequently in films made from the blood in the heart than in those made from the peripheral circulation. R.T.L.

(33e) During herd reductions at the National Bison Range at Moiese, Montana, the helminths found were *Fasciola hepatica*, *Moniezia benedeni*, *Dictyocaulus viviparus* (syn. *D. hadweni*) and *Trichuris ovis*, while at the Yellowstone National Park Bison Range in Wyoming, only *M. benedeni* was found. Although *Haemonchus contortus* and *Oesophagostomum radiatum* were especially looked for, none was found. R.T.L.

(33f) The life-history of *Metagonimoides oregonensis* of the racoon, *Procyon lotor pacifica*, has been followed in *Goniobasis silicula*. The rediae produce pleurolophocercariae without the intervention of daughter rediae. Some of these lophocercariae emerge from the rediae as free-swimming forms which penetrate the skin of frogs and tadpoles and encyst as metacercariae in the striated muscles. Others develop directly within the rediae into unencysted metacercariae. Both types develop into sexually mature flukes in seven days when fed experimentally to hamsters. Encysted metacercariae were also found in naturally infected *Rana aurora aurora*. Infected snails and frogs are equally infective to the racoon and both are known to be represented in its diet. Ingles had concluded that in *Goniobasis nigrina* there were no free-swimming cercariae [for abstract see Helm. Abs., **4**, No. 68c]: either his "cercaria" was an early intermediate stage of development towards the metacercaria in the redia, or the free-swimming stage which occurs in *G. silicula* is lost in *G. nigrina*. R.T.L.

(33g) Of seven compounds of the diphenyl methane series, one diphenyl propane and one diphenyl ether tested for anthelmintic value against *Raillietina cesticillus*, only two, viz., 2,2′-dihydroxy-3,3′,5,5′,6,6′-hexachlorodiphenyl methane and 2,2′-dihydroxy-3,3′,4,4′,5,5′,6,6′-octachlorodiphenyl ether, showed a high degree of activity when given as a single oral dose in capsule to a small number of New Hampshire chickens. One table gives the data on dosage etc., and another summarizes data in respect of the position of the various atoms and chemical groups in the molecules. R.T.L.

(33h) *Pseudospelotrema ammospizae* n.sp. was collected from the seaside sparrow (*Ammospiza maritima*) at Beaufort, North Carolina. It most closely resembles *P. cincli* but can be distinguished by its thick-walled cirrus pouch, smaller oesophagus, position and character of the vitellaria, lack of a convoluted seminal vesicle and the approximately equally sized suckers. R.T.L.

33—Journal of Parasitology (cont.)

i. HARGIS, Jr., W. J., 1953.—" Monogenetic trematodes of Westhampton Lake fishes. III. Part 1. Comparative morphology of the species encountered." **39** (1), 88–105.
j. PRICE, E. W., 1953.—" The fluke situation in American ruminants." **39** (2), 119–134.
k. OGREN, R. E., 1953.—" *Capillaria blarinae*, n.sp. (Nematoda: Trichuridae) from the esophagus of the short-tailed shrew, *Blarina brevicauda* (Say)." **39** (2), 135–138.
l. MANN, P. H. & FRATTA, I., 1953.—" Transplantation of adult heartworms, *Dirofilaria immitis*, into dogs and cats." **39** (2), 139–144.
m. DORAN, D. J., 1953.—" New monogenetic trematodes from the shovelnose guitarfish, *Rhinobatos productus* (Ayres)." **39** (2), 145–151.

(33i) The 26 species of Monogenea here briefly annotated were collected from the gills of 7 species of lake fishes belonging to the Centrarchidae, Cyprinidae and Ameiuridae. R.T.L.

(33j) Price reviews present knowledge of the flukes of livestock in the U.S.A. and outlines outstanding problems of which the more urgent are (i) the status of the species of *Fasciola* and their pathogenicity, (ii) the bionomics of their intermediate hosts and other factors concerned with the propagation and dissemination of these flukes, (iii) the development of molluscicides, other than copper sulphate, non-toxic to aquatic life, (iv) the discovery of a molluscicide applicable to pastures for the control of the vector of *Dicrocoelium dendriticum*, (v) the development of drugs for the destruction of immature *Fasciola* in the liver tissues, (vi) the discovery of a drug effective against *Dicrocoelium dendriticum* in infected animals. The validity of the various species of *Fasciola* which have been reported from ruminants in the U.S.A. is discussed. In the Gulf Coast ruminants there are three types of *Fasciola* resembling *F. hepatica*, *F. gigantica* and one which is probably a hybrid of these. Price recalls that between 1875 and 1880 Brahman cattle were imported into this area from India where *F. gigantica* is known to be present. The incidence of *Fascioloides magna* in some sections of the U.S.A. is very high. Deaths in sheep and goats are frequent. *Dicrocoelium dendriticum* has become established in the U.S.A. relatively recently. Several dicrocoeliids require a further vector and ants have been shown by Krull & Mapes (1952) [for abstract see Helm. Abs., **21**, No. 374c] to act as the second intermediate host. Paramphistomiasis in American ruminants is of little or no economic importance. *Paramphistomum cervi* is comparatively rare. The most abundant form is *P. microbothrioides*. There is a third species closely related to or identical with *P. liorchis*. A summary of methods of fluke control and their applicability to different regions concludes this presidential address to the American Society of Parasitologists. R.T.L.

(33k) *Capillaria blarinae* n.sp. from *Blarina brevicauda* in Illinois is differentiated by its small size from all other species for which the habitat is the oesophagus. The male measures 6–12 mm. and the female 10–18 mm. in length. The spicule is only 0·179–0·363 mm. long. The adult worm lives in small, wave-shaped tunnels in the cornified squamous portion of the oesophageal epithelium. No abnormal tissue proliferation was observed. R.T.L.

(33l) Adult *Dirofilaria immitis* were successfully transplanted into the jugular vein of dogs and cats. Microfilariae were present later and living adult worms were found in the heart 4 to 52 days after transplantation in these experimental hosts. In rabbits, however, no microfilariae appeared in the circulation: all the worms were recovered from the lungs but were dead at post-mortem as early as one month after transplantation. R.T.L.

(33m) Three undescribed monogenetic trematodes were collected from the gills of the shovelnose guitarfish, *Rhinobatos productus*, at Los Angeles. *Rhinobatonchocotyle cyclovaginatus* n.g., n.sp. differs from the four known genera of Hexabothriinae by the cyclic nature of the vagina. The cirrus is unarmed, the polar filaments are absent from the eggs which lack also meridional ridges. The haptoral sclerites and suckers are nearly equal in size. *Heterocotyle papillata* n.sp. is characterized by the absence of cephalic glands and of conical papillae on the dorsal surface of the haptor. In its measurements, location of the ovary, testes, cirrus and

33—Journal of Parasitology (cont.)

n. ABDEL-MALEK, E. T., 1953.—" Life history of *Petasiger chandleri* (Trematoda: Echinostomatidae) from the pied-billed grebe, *Podilymbus podiceps podiceps*, with some comments on other species of *Petasiger*." **39** (2), 152–158.
o. BROOKS, C. P., 1953.—"A comparative study of *Schistosoma mansoni* in *Tropicorbis havanensis* and *Australorbis glabratus*." **39** (2), 159–165.
p. BUMBALO, T. S., GUSTINA, F. J. & OLEKSIAK, R. E., 1953.—" The treatment of enterobiasis with thymyl-N-isoamylcarbamate (Egressin)." **39** (2), 166–168.
q. COIL, W. H., 1953.—"A new gorgoderid cercaria parasitic in *Lampsilis ventricosa* Barnes." **39** (2), 183–186.
r. VENARD, C. E. & WARFEL, J. H., 1953.—" Some effects of two species of Acanthocephala on the alimentary canal of the largemouth bass." **39** (2), 187–190.

vagina it also differs from other species of the genus. *Spinuris lophosoma* n.g., n.sp. is best placed in the Monocotylinae as the intestine is double, the vagina single and there are hooks on the septate haptor. It has two rows of haptoral spines and lateral curved cuticular bars on the posterior part of the body which distinguish it from all other monogenetic trematodes. R.T.L.

(33n) Under a similar title, an abstract of this paper was published in *J. Parasit.*, 1952, **38** (4, Sect. 2), Suppl. p.39 [for abstract see Helm. Abs., **21**, No. 230dj]. An account is now given of the extra-molluscan phase of the life-history. When exposed to the cercaria of *Petasiger chandleri* the following fish became infected: *Ameiurus nebulosus*, *Perca flavescens*, *Notropis* sp., *Semotilus atromaculatus*, *Poecilichthys exilis*, *Fundulus* sp., *Chrosomus eos.*, and *Notemigonus crysoleucas*. The first two proved the most susceptible. Nevertheless, no natural infections in any of these fish were found during an examination of hundreds of specimens from the same locality. Abdel-Malek points out that a number of other species of *Petasiger* have been described from grebes. The specific differences are frequently slight and their variation range may overlap. He nevertheless considers that the lumping together of species of this genus should be done with caution until their life-cycles have been studied. R.T.L.

(33 o) An abstract of this paper appeared in *J. Parasit.*, 1952, **38** (4, Sect. 2), Suppl. p. 33 [for abstract see Helm. Abs., **21**, No. 230cr]. Additional data are now given. Approximately equal numbers of miracidia of *Schistosoma mansoni* invaded *Tropicorbis havanensis* and *Australorbis glabratus*. In *T. havanensis* they were surrounded by tissue proliferation and a cellular infiltration which eventually resulted in their destruction. Only exceptionally did sporocysts develop. In *A. glabratus* there was no tissue response and the miracidia developed normally. R.T.L.

(33p) Egressin was administered to 31 children and three adults in tablets of 0·025 gm. for smaller children and 0·5 gm. for older children and adults. The average dose was 0·87 gm. per lb. body-weight. Three doses were given daily in equal parts after meals for five consecutive days. 53% were cured. These results are comparable to those obtained with Diphenan; the percentage of cures is less than with gentian violet or phenothiazine, but it is a non-toxic and safe chemotherapeutic agent. R.T.L.

(33q) *Cercaria eriensis* n.sp. is an apharyngeate cercaria which develops in *Lampsilis ventricosa* in Lake Erie. It is styleted and has a motile filamentous tail thus differing from all known gorgoderid cercariae. R.T.L.

(33r) *Leptorhynchoides thecatus* and *Neoechinorhynchus cylindratus* are common acanthocephalan parasites of *Huro salmoides*. The former, which inhabits the pyloric caeca, completely disorganizes the mucosa and submucosa surrounding its embedded anterior end, but the tunica muscularis is not damaged. The latter species lives in the small intestine where it causes much less damage at the point of attachment. R.T.L.

33—Journal of Parasitology (cont.)

s. MOORE, D. V., THILLET, C. J., CARNEY, D. M. & MELENEY, H. E., 1953.—" Experimental infection of *Bulinus truncatus* with *Schistosoma haematobium*." **39** (2), 215–221.
t. ALICATA, J. E., 1953.—" Observations of the action of papain on experimental trichiniasis in rats." **39** (2), 222.
u. MONACO, L. H. & MIZELLE, J. D., 1953.—" Duplicated uteri in *Ascaris lumbricoides* var. *suum*." **39** (2), 222–223.
v. HARGIS, Jr., W. J., 1953.—" Chloretone as a trematode relaxer, and its use in mass-collecting techniques." **39** (2), 224–225.
w. STUNKARD, H. W., 1953.—" Natural hosts of *Microphallus limuli* Stunkard, 1951." **39** (2), 225.
x. SMITH, P. E., 1953.—" Incidence of *Heterakis spumosa* Schneider, 1866 (Nematoda: Heterakidae) in wild rats." **39** (2), 225–226.
y. CHANDLER, A. C., 1953.—"An outbreak of *Prosthenorchis* (Acanthocephala) infection in primates in the Houston Zoological Garden, and a report of this parasite in *Nasua narica* in Mexico." **39** (2), 226.

(33s) The abstract of this paper appeared in *J. Parasit.*, 1952, **38** (4, Sect. 2), Suppl. p. 35 [for abstract see Helm. Abs., **21**, No. 230cx]. Further data are now given of the laboratory methods followed for the maintenance of colonies of *Bulinus truncatus*, *Australorbis glabratus* and *Oncomelania nosophora*. In Standen's artificial diet, dried lettuce was replaced by Cerophyl and 1% of a commercial fish food, Glandex, was added. The results of exposure to *Schistosoma haematobium* miracidia of *B. truncatus* of different ages are tabulated. Laboratory infected *B. truncatus* survived only 10 to 21 days after they began to shed cercariae. R.T.L.

(33t) The administration of 150 mg. of papain did not reduce the number of adult and larval trichinae recovered from white laboratory rats as compared with those recovered from the untreated controls. R.T.L.

(33u) Among about 2,500 specimens of *Ascaris lumbricoides* var. *suum* the uterus was partially duplicated in two and completely duplicated in two. Previous workers in the same laboratory had found this anomaly in four out of about 5,000 specimens. R.T.L.

(33v) Hargis describes the use of chloretone (2 gm. in 500 ml. of water) for relaxing trematodes. He has also used it successfully on various acanthocephalans, cestodes and nematodes. The material is left in the medium for 30–40 minutes, shaken periodically and then fixed. R.T.L.

(33w) Although metacercariae of *Microphallus limuli* developed to sexual maturity in white mice and golden hamsters, the worms did not persist for more than nine days and the experimental animals were refractory to reinfection. It is now shown that *Larus argentatus* is a normal host as heavy infections followed the feeding of infected *Limulus polyphemus* to young herring gulls. The worms were larger and persisted for over three months. Probably other shore birds also serve as natural definitive hosts. The first intermediate host is still unknown. *L. polyphemus*, the second intermediate host, becomes infected when the carapace is 20–30 mm. in width. R.T.L.

(33x) Of the rats trapped in the city blocks of Baltimore 94% were positive for *Heterakis spumosa*. This is much higher than the incidence recorded by Winfield in 1933. Some of the rats examined by him came from the Baltimore city dump. R.T.L.

(33y) Deaths among *Hylobates leuciscus*, *Macacus nemestrinus* and *Saimiri sciurea* at the Houston Zoological Garden followed diarrhoea, loss of appetite and progressive weakness and are attributed to infection with *Prosthenorchis*. A species of this genus is also recorded from *Nasua narica* in Chiapas, Mexico. R.T.L.

33—Journal of Parasitology (cont.)

z. BABERO, B. B. & RAUSCH, R., 1953.—" Some observations on host relationships of *Diphyllobothrium* sp. in cats." **39** (2), 226–227.

ba. MAUER, S. I., STAUBER, L. A. & GRUN, J., 1953.—" The Syrian hamster, *Cricetus auratus*, host of *Protospirura muris*." **39** (2), 227–228.

bb. ROBINSON, Jr., E. J., 1953.—"A possible molluscan host of *Hasstilesia tricolor* (Trematoda: Brachylaemidae)." **39** (2), 228.

(33z) In this preliminary account of the results of feeding cats with plerocercoids of *Diphyllobothrium* sp. from the rainbow trout, *Salmo gairdnerii*, it is confirmed that the growth rate and maturation of the worms is delayed. The opinion is expressed that although an occasional worm reached sexual maturity and produced eggs, the cat is not a suitable host and probably does not serve as a reservoir host in nature. R.T.L.

(33ba) A heavy infection with *Protospirura muris* was discovered in one specimen of *Cricetus auratus* purchased from Maryland. R.T.L.

(33bb) In two out of 248 examples of *Vertigo ovata* collected from a lawn frequented by cottontail rabbits (*Sylvilagus sylvaticus*) infected with *Hasstilesia tricolor*, there were branched sporocysts, stump-tailed cercariae and numerous brachylaemid cercariae which closely resembled adult *H. tricolor*. 46 days after a laboratory-reared cottontail rabbit had been fed with an entire snail, 230 adult *H. tricolor* were collected from the intestine at post-mortem. R.T.L.

34—Journal of the South African Veterinary Medical Association.

a. SUTTON, G. D., 1953.—" The association of enterotoxaemia (pulpy kidney) with other diseases of sheep." **24** (1), 31–32.

(34a) Deaths occurred in a flock of sheep which had been inoculated against enterotoxaemia and should have been immune. Post-mortem on one of the flock showed a severe infection with trichostrongyles accompanied by marked catarrhal inflammation of the intestine. Material in the small intestine contained enterotoxaemia toxin. The kidneys were red and flabby. It is suggested that the parasitic infection in setting up intestinal inflammation may cause a breakdown in immunity in inoculated sheep or be an exciting cause in the development of enterotoxaemia. R.T.L.

35—Journal of the Tennessee Academy of Science.

a. MASON, Jr., J., 1953.—" *Brachylaima dolichodirus* n.sp. from a shrew, *Blarina brevicauda*." **28** (1), 38–42, 85.

b. EDNEY, J. M., ARBOGAST, F. & STEPP, J., 1953.—" Productivity in gravid *Trichinella spiralis* (Owen, 1835) transplanted into laboratory rats." **28** (1), 62–68.

(35a) *Brachylaima dolichodirus* n.sp. collected from the shrew, *Blarina brevicauda*, in the Backbone Rock State Park, Tennessee, is characterized by its large size (7·084 mm. to 9·685 mm.) and its unusually long neck. The caeca turn directly backwards, immediately behind the pharynx. The vitellaria extend to the level of the end of the posterior testis. R.T.L.

(35b) Single gravid *Trichinella spiralis* transplanted into rats produced an average of 345·4 larvae. The age, size and strain of the host did not appear to affect the productivity of the parasite. Differences in the numbers of larvae recovered at autopsy 35 days or more after infection are attributable to a variable "productive potential" factor in the adults. R.T.L.

36—Journal of Tropical Medicine and Hygiene.

a. SEITZ, E., 1953.—" Evaluation of various methods of treatment of urinary schistosomiasis in a coastal area of Tanganyika." **56** (1), 2–4.
b. HELMY, M., 1953.—" The effect of environmental factors on the distribution and control of *Planorbis boissyi*, the intermediate host of *Schistosoma mansoni* in the valley of the Nile." **56** (2), 25–32.
c. FREEDMAN, L., 1953.—" Some observations on intestinal parasites of man and their diagnosis." **56** (3), 49–53.
d. ANON., 1953.—" Schistosomiasis." [Editorial.] **56** (4), 73–74.
e. AUGUSTINE, D. L., 1953.—" Filariasis in tropical Asia." **56** (4), 75–82.
f. ALVES, W. & CLARKE, V. DE V., 1953.—" A key to the families of some African gastropods." **56** (4), 84–89.

(36a) From a comparison of the results obtained by treating groups of cases of urinary schistosomiasis (each group consisting of 40 cases) by (i) injections of sodium antimonyl tartrate given as a long course of 10–16 injections over a period of about 3 weeks or as short intensive courses of one and two days' duration, and by (ii) the oral administration of Nilodin as sugar-coated or plain tablets Seitz is of the opinion that the parenteral use of sodium antimonyl tartrate is vastly superior to oral treatment with Nilodin. R.T.L.

(36b) The absence of *Planorbis boissyi* from the whole of Upper Egypt, from Khartoum to Cairo, is attributed to its sensitivity to water movements which prevents it from finding sufficiently stagnant water. Its local distribution is further influenced by its sensitivity to desiccation and therefore to the level of the subsoil water and by the presence or absence of aquatic weeds. It is suggested that the Delta is occasionally restocked by fresh specimens attached to floating debris carried down by the Nile from the Sudan but, as compared with *Bulinus truncatus*, this is a rare occurrence. Helmy believes that permanent eradication and exclusion of these molluscs are attainable by correct canal planning and irrigation control whereby adequate drainage and weed-free channels with a steady flow of water are maintained, dead-ends suppressed and thorough drying out takes place periodically. R.T.L.

(36c) This is a brief description of the main techniques employed in the laboratory diagnosis of helminth infections. R.T.L.

(36f) The authors have devised a simple working key to the families and some genera of African molluscs, primarily for those who are not experts but are interested in the molluscs as vectors of schistosomiasis. An illustrated glossary of the terms used in the key is provided. R.T.L.

37—Journal of the Washington Academy of Sciences.

a. YOUNG, R. T., 1953.—" *Postmonorchis donacis*, a new species of monorchid trematode from the Pacific coast, and its life history." **43** (3), 88–93.

(37a) *Postmonorchis donacis* n.sp. is a parasite of *Menticirrhus undulatus*, *Roncador stearnsi* and surf perches (Embiotocidae). It differs from *P. orthopristis* in its shape which is slender. The length of the testis is greater than the width. The posterior notch is absent. The excretory bladder is approximately spherical. The uterus almost fills the posterior portion of the body. In the clam, *Donax gouldii*, sporocysts produce cercariae which resemble *Cercaria myocerca* and *C. cummingiae*. Attempts to infect clams experimentally failed but young fish, *Embiotoca jacksoni*, *Micrometris* and *Cymatogaster*, were successfully infected with metacercariae from clams. Young points out that should subsequent experiments prove that *Cercaria donacis* and *C. myocerca* are identical, the latter name would have priority. R.T.L.

38—Lebensmitteltierarzt.

a. STRUCK, M., 1953.—"Ein Beitrag über das Vorkommen von Trichinen." **4** (3), 26–27.
b. SCHÖNBERG, F., 1953.—"Gleichzeitiges Vorkommen von *Trichinella spiralis* und *Agamodistomum suis* in einer Wanderratte." **4** (3), 27–28.

(38a) Struck stresses the need for continuing strict Trichinella inspection in Germany in spite of the attempts by certain commercial interests to cast doubts on the need for it. The consumption of raw or inadequately cooked meat is much commoner than in the U.S.A. so that inspection in that country is not perhaps of such importance. Between 1945 and 1950 Trichinella was found (in Germany) in 55 pigs, 7 wild boar and 42 other animals. In 1952, at Hamburg, 157 out of 1,170,200 samples of imported American bacon were found to be trichinous. A.E.F.

(38b) Schönberg records simultaneous infection in a common rat with *Trichinella spiralis* and *Agamodistomum suis*. Both migrating and encapsulated Trichinella larvae were found in the diaphragm and shoulder muscles and *A. suis*, both free and encapsulated, were recovered from the connective tissue of both diaphragm and extremity muscles. A.E.F.

39—Malayan Agricultural Journal.

a. LARTER, L. N. H. & ALLEN, E. F., 1953.—"Notes on current investigations, October to December, 1952." **36** (1), 36–43.

(39a) In Selangor, bananas which were frequently very stunted and backward were found to be infected with eelworm, presumed to be *Radopholus similis*. The same eelworm causes serious damage to pepper in Banka and Borneo. R.T.L.

40—Monatshefte für Veterinärmedizin.

a. TIMM, W., 1953.—"Ein Beitrag zur Behandlung des Endoparasitenbefalls von Läuferschweinen mit Natriumfluorid." **8** (2), 26–29.
b. KRAHNERT, R., 1953.—"Magenwürmer beim Huhn." **8** (2), 33.

(40a) Timm has tested the efficacy of "Suscaridin" (a preparation containing 1% sodium fluoride in vegetable matter) against helminths in pigs. Ten animals, aged from three to five months, were treated. One animal was given a total dose of 0·25 gm., a second 0·26 gm. and the remaining eight pigs received a total of 0·3 gm. sodium fluoride; in each case the dose was administered in two equal parts with an 18-hour interval. The two lower doses eliminated *Ascaris lumbricoides* and greatly reduced the egg count of *Hyostrongylus rubidus* and *Oesophagostomum dentatum*. The eight pigs given the 0·3 gm. were infected only with Hyostrongylus and Oesophagostomum but in each case both species were completely eliminated. The paper concludes with advice on the administration of sodium fluoride. A.E.F.

(40b) Krahnert gives a very brief account of *Acuaria hamulosa* and describes the pathology of infection with this parasite in the domestic fowl. He records a severe outbreak in a flock of some 60 white Leghorns which led to many deaths in 1949; the introduction of hygienic measures in both hen houses and runs resulted, within four years, in greatly reduced incidence with no deaths. A.E.F.

41—N.A.A.S. Quarterly Review. London.

a. ROEBUCK, A., 1953.—"The story of the root eelworms in the East Midlands." No. 19, pp. 316–322.

(41a) Roebuck recalls the history of the appearance and spread of *Heterodera rostochiensis*, *H. schachtii* and *H. major* in England and reviews their incidence on farms in the East Midlands. The results of soil sampling for *H. rostochiensis* cysts between 1943 and 1952 are tabulated. The infection has steadily enlarged its range from the two main focal centres in Lincolnshire, i.e. the Isle of Axholme in the north-west and the fen parishes to the

south-east, and is now present in 122 parishes in Lindsey and 53 in Kesteven. A high proportion of them are definitely sick. Sampling provides data upon which farmers can be advised on their rotations, but no cure has yet been discovered. By 1952 *Heterodera schachtii* of sugar-beet had been detected in 29 fields and seven sewage farms in the East Midlands. Of these, 28 fields and one sewage farm were in Lincolnshire, one field and one sewage farm in Derbyshire, three sewage farms in Northamptonshire, one in Leicestershire and one in Rutland. In 1952 the cereal root eelworm, *H. major*, had been detected at 26 sites scattered over the northern part of the East Midlands. The pea root eelworm, *H. göttingiana*, has been detected only twice, once in Kesteven and once in Nottinghamshire, and the cabbage root eelworm, *H. cruciferae*, has so far been found in one field located in the north of Lindsey. R.T.L.

42—Nature. London.

a. FENWICK, D. W. & REID, E., 1953.—" Seasonal fluctuations in the degree of hatching from cysts of the potato root eelworm." [Correspondence.] **171** (4340), 47.
b. LAL, M. B., 1953.—"A new trematode metacercaria from the eyes of trout." [Correspondence.] **171** (4342), 130–131.
c. TETLEY, J. H., 1953.—" Inhibition of populations of *Haemonchus contortus* in sheep fed on white clover (*Trifolium repens*) high in lotaustralin." [Correspondence.] **171** (4346), 311.
d. MANSON-BAHR, P., 1953.—" The fight against filariasis in the Pacific." **171** (4348), 368–371.
e. JONES, F. G. W. & WINSLOW, R. D., 1953.—" Hatching responses in root eelworms (*Heterodera* spp.)." [Correspondence.] **171** (4350), 478–479.
f. SOMMERVILLE, R. I., 1953.—" Development of *Ostertagia circumcincta* in the abomasal mucosa of the sheep." [Correspondence.] **171** (4350), 482–483.
g. LEES, E., 1953.—" Life-history of *Gorgoderina vitelliloba* (Olsson)." [Correspondence.] **171** (4350), 485.
h. McCHLERY, R., 1953.—" Tainting of tobacco by a dichloropropene-dichloropropane soil fumigant." [Correspondence.] **171** (4352), 578.
i. MATTINGLY, P. F., 1953.—" Distribution of animals and plants in Africa." **171** (4354), 639–640.

(42a) Fenwick & Reid have succeeded in conducting *in vitro* hatching tests for a number of years without any apparent diminutions in "hatchability" of cysts during the winter months. They describe their methods of storing cysts and conclude that the seasonal fluctuations in hatch described by other workers are the effect of environmental conditions. D.W.F.

(42b) The metacercariae found in the eyes of various fresh-water fishes in Britain have hitherto been identified as *Diplostomum volvens*. In specimens commonly found by Lal in the vitreous humour of Scottish *Salmo trutta*, the oral sucker is much larger than the ventral sucker which is post-equatorial. The lateral adhesive organs are cup-shaped, sucker-like structures. It is figured and named *Diplostomulum truttae* n.sp. R.T.L.

(42c) Some trichostrongylid infective larvae were killed *in vitro* (i) by solutions of potassium cyanide in which the concentrations of hydrogen cyanide approximated that which could be expected in the rumen of sheep fed on white clover, and (ii) when exposed in water over macerated white clover. Seven-months-old lambs were fed on parasite-free experimental paddocks of (i) certified pedigree white clover containing 0·023% of hydrogen cyanide, (ii) red clover containing doubtful traces of hydrogen cyanide and (iii) cocksfoot which does not contain hydrogen cyanide. The lambs on each paddock then received 2,000 *Haemonchus contortus* infective larvae. Fourteen days later, they were slaughtered and the *H. contortus* populations counted. Fifth instar forms only were recovered. The average populations of those lambs fed on the white and red clover paddocks were 72·9% and 87·8% of those from the cocksfoot paddock, but as the difference between the white clover and cocksfoot populations and the red clover populations did not reach the 5% level of significance, there was some doubt if the cyanide content was the only lethal factor involved. R.T.L.

(42e) Jones & Winslow have investigated the hatching responses of larvae of several species of *Heterodera* when exposed to the root diffusates of host plants and of non-host plants. Beet, potato and carrot root eelworms behaved normally, responding only to diffusates from

roots of their respective hosts and other plants invaded by them. Cabbage root eelworm responded to diffusates from hosts of the genus *Brassica* but not to those from other cruciferous hosts and non-hosts. In contrast, *Galeopsis* and clover root eelworms showed little or no response to diffusates from their typical hosts but responded readily to pea root diffusate. Hop root eelworm responded to hop, hemp, *Urtica urens* and *Parietaria diffusa*. Negligible responses to all diffusates tested were given by pea and oat root eelworms. Following these results, reliable estimates were obtained in preliminary experiments on the quantitative estimation of the species in a mixed population of beet, cabbage and *Galeopsis* root eelworms by exposing the mixed cysts to a succession of plant root diffusates. The hatching curve for larvae of beet, cabbage and *Galeopsis* eelworms is shown to be very similar to that found by Fenwick for potato root eelworm. In several cases, larvae have been found to hatch in response to diffusate of plants which do not serve as hosts and these plants have possibilities for the biological control of the eelworm concerned. These are *Coronopus squamatus* which stimulates beet eelworm larvae; *Solanum nigrum* which stimulates potato root eelworm larvae; *Parietaria diffusa* which stimulates hop eelworm larvae; and pea which stimulates clover and *Galeopsis* eelworm larvae. The last two, from the similarity of their behaviour, may be one species. M.T.F.

(42f) Worm-free sheep which had received a single dose each of about 20,000 infective larvae of *Ostertagia circumcincta* were autopsied at intervals of 3 to 84 days. In those killed on the third and fourth day, third-stage larvae had penetrated the gastric pits of the abomasal mucosa. Some left the mucosa after the third ecdysis and lived on the surface; others continued to grow leaving at any stage of development, while others failed to develop and remained in the glands and gastric pits for three months after the infection. In naturally acquired infections the faeces may therefore not contain *Ostertagia* eggs for several months but meanwhile damage may be done to the mucous membrane. The majority of the larvae were mostly, singly or in pairs, in small nodules in the pyloric region and around the cardiac orifice. In some instances there were groups of four to ten larvae in large flattened nodules towards the edges of the spiral folds of the peptic region. This extended histotropic phase may influence the effect of anthelmintics and explain the relative failure of phenothiazine against *O. circumcincta* as compared with its action on *Trichostrongylus* spp. R.T.L.

(42g) Lees has traced the life-cycle of *Gorgoderina vitelliloba* experimentally. The miracidia entered *Sphaerium* sp. and *Pisidium* sp. The cercariae when fed to tadpoles became metacercariae. Metacercarial cysts were found in tadpoles of English *Rana temporaria* and these gave rise to adults when fed to frogs and toads known to be free from infection. R.T.L.

(42h) Referring to Shepherd's letter which appeared in *Nature. Lond.*, 1952 [for abstract see Helm. Abs., **21**, No. 463e] McChlery states that the Executive Committee of the Tobacco Pest Control Research Scheme in Southern Rhodesia, after very full consideration, decided that the results of the investigation (to which Dr. Shepherd referred) should not be published as it was of a preliminary nature without controls. It is suggested that the tainting may have been due to failure to follow the instructions for the use of the fumigant or to the abnormally wet weather at the time of planting. R.T.L.

(42i) Mattingly summarizes the papers read at a whole day meeting of the Linnean Society of London on 29th January, 1953. One of these was a short communication by Dr. W. G. Kershaw on the distribution of human filarial parasites in West Africa. Their distribution could be related in varying degree to the vegetational zones. The Chrysops vectors of *Loa loa* feed on infected monkeys in the canopy, on man on the ground or in houses built on ridges level with the canopy, and disappear as soon as the forest fringe is crossed. In the case of *Acanthocheilonema perstans* very different vegetational zones can provide suitable conditions for while it also is ubiquitous in the forest and is abundant in the arid eroded grasslands of the Bauchi plateau, it is absent from the mountain grasslands. R.T.L.

43—New Zealand Journal of Agriculture.

a. McCALLUM, D. W., 1953.—" Soil sterilisation with chloropicrin." **86** (3), 237, 239–240.

(43a) This is an illustrated account of the methods for applying chloropicrin for the sterilization of soil in green-houses with a warning note on the precautions to be taken by those using this chemical. R.T.L.

44—New Zealand Journal of Science and Technology. B. General Research Section.

a. BULL, P. C., 1953.—" Parasites of the wild rabbit, *Oryctolagus cuniculus* (L.) in New Zealand." **34** (5), 341–372.

(44a) The incidence of helminths collected from 6,000 wild rabbits in Hawke's Bay, New Zealand, was *Passalurus ambiguus* 61·5%, *Trichostrongylus retortaeformis* 95%, *Graphidium strigosum* 81%, *Fasciola hepatica* 2·7%, *Cysticercus pisiformis* 13%, *Coenurus serialis* under 1%, *Nematodirus spathiger* (in 7 rabbits only). A single instance of *Trichostrongylus axei* is a new record for New Zealand. The local incidences and population sizes of *T. retortaeformis* and *G. strigosum* are tabulated. There was no clear evidence among the rabbits examined that *T. retortaeformis* was pathogenic but it is recalled that sick rabbits seldom come into the open. On the effects of *G. strigosum* little information was obtained. It was noticed that in some of the heavy infections the worms were closely packed together and so deeply embedded in the stomach wall that they appeared to be covered only by the peritoneum. These worms were very small and the females contained few or no eggs yet the general condition of the rabbits was invariably good. R.T.L.

45—Parasitology.

a. SPRENT, J. F. A., 1953.—" On the life history of *Ascaris devosi* and its development in the white mouse and the domestic ferret." **42** (3/4), 244–258.
b. DOUGHERTY, E. C., 1953.—" Problems of nomenclature for the growth of organisms of one species with and without associated organisms of other species." **42** (3/4), 259–261.
c. MACKERRAS, M. J., 1953.—" Lizard *Filaria*: transmission by mosquitoes of *Oswaldofilaria chlamydosauri* (Breinl) (Nematoda: Filarioidea)." **43** (1/2), 1–3.
d. REES, G., 1953.—" Some parasitic worms from fishes off the coast of Iceland. I. Cestoda." **43** (1/2), 4–14.
e. REES, G., 1953.—" Some parasitic worms from fishes off the coast of Iceland. II. Trematoda (Digenea)." **43** (1/2), 15–26.
f. REES, G., 1953.—"A record of some parasitic worms from whales in the Ross Sea area." **43** (1/2), 27–34.
g. YOSUFZAI, H. K., 1953.—" Shell gland and egg-shell formation in *Fasciola hepatica* L." **43** (1/2), 88–93.
h. NEW, D. A. T., 1953.—" The reproductive habits and sex-determination of the nematode *Rhabditis pellio* Bütschli, with a note on its taxonomy and nomenclature." **43** (1/2), 94–101.
i. WATSON, J. M., 1953.—" Human trichostrongylosis and its relationship to ancylostomiasis in southern Iraq, with comments on world incidence." **43** (1/2), 102–109.

(45a) Using white mice as intermediate hosts and ferrets as final hosts Sprent has followed experimentally the development of the larval stages of *Ascaris devosi* for which the definitive hosts in nature are *Martes* spp. The 1st-stage larvae became fully differentiated between the 8th and 12th day after culturing the eggs. The first moult occurred within the egg-shell. The embryonated eggs were infective to mice on the 12th day and were still infective a year later. The 3rd-stage larvae were found encapsulated in the gut wall, liver, lungs, kidney, brain, heart, spleen and mesentery, and throughout the carcasses of the mice. The 4th-stage larva obtained from ferrets is described and the various body measurements tabulated. The adults reached sexual maturity in the ferret in 56 days. The life-history of the species which requires a true intermediate host and that of *Ascaris lumbricoides*, in which development is direct, are contrasted and the conclusion is drawn that the earliest members of the Ascaridae utilized an intermediate host and were not skin-penetrating forms. R.T.L.

(45b) Dougherty proposes the adoption of a system of terminology to describe varic relationships between organisms in nature and in laboratory cultivations. The terms propos are "gnotobiotic" where no associated organisms or only known species are present a "agnotobiotic" where there are one or more species of associated organisms of which one least is unknown. Axenic is to be used when there are no associated organisms and synxer when known associated species number one or more. If the number of species of kno associated organisms is one, two, three or several the terms monoxenic, dixenic, trixenic a polyxenic respectively are to be used. Instead of parasitic and non-parasitic Dougher prefers symbiotic and non-symbiotic. He hopes that the present widespread application symbiosis to a mutually beneficial relationship of two or more organisms will eventually replaced by the term mutualism. Symbiosis used in a broad sense can usefully be sub-divid into commensalism, parasitism and mutualism. R.T.

(45c) The life-cycle of *Oswaldofilaria chlamydosauri* has been followed in *Culex fatiga* and *C. annulirostris* and the filaria has been transmitted experimentally to uninfected je lizards, *Amphibolurus barbatus*, in the blood of which microfilariae appeared four to six mont later. The infective larvae are smaller than those of *Wuchereria bancrofti* and are very simil to those of *Conispiculum guindiensis*. R.T.

(45d) So far parasitic worms have not been recorded from fishes collected from the ea coast of Iceland. Rees now describes and figures *Phyllobothrium acanthiae-vulgaris* fro *Squalus acanthias*, *Echeneibothrium minimum* from *Raja clavata* and the plerocercoid *Hepatoxylon trichiuri* from *Gadus callarias*. The fish were caught by a trawler. R.T.

(45e) *Lepidophyllum steenstrupi* is the only species of digenetic trematode so far recorde from fishes in Icelandic waters. In a collection obtained from fishes trawled off the coast Iceland, eight species were present. One of these is new and is described and figured fro *Anarhichas minor*. It is named *Steganoderma pycnorganum* n.sp. [but is not specifically differentiated from the other species of the genus]. R.T.

(45f) Rees records the parasitic worms collected from four species of whales b Mr. W. Ross Cockrill during an investigation into the pathology of whales in the Ross Se area. The collection comprised five species of Cestoda, two species of Nematoda and tw species of Acanthocephala. None are new but the sperm whale is a new host for *Priapocephalu grandis* and *Tetrabothrius wilsoni*. R.T.L.

(45g) The egg-shell of *Fasciola hepatica* is formed from an extremely hyaline secretio produced by the shell gland. As it moves along the uterus, the shell is temporarily reinforce by vitelline granules which are released when the vitelline cells enter the vitelline reservoir In the elliptical chamber of the shell gland, oocytes, vitelline granules and vitelline cells are mixed together. The eggs are fully formed when they pass out of the elliptical chamber into the uterus where the spermatozoa then penetrate the shell. R.T.L.

(45h) Although males of *Rhabditis pellio* are invariably present in rotting earthworms, they rarely appear in laboratory bred cultures. Dew finds that *R. pellio* can be cultured indefinitely on *Lumbricus* extract. Although the females can usually reproduce partheno- genetically, males are only produced in the offspring if copulation has taken place. The ratio of males to females is highly variable. This is explained on the hypothesis that (i) the ratio never exceeds a 1M:1F value because sex determination is by the XO (or XY) and XX type where XO is male and XX is female; (ii) the proportion of males often falls below this value because numerous females can be produced parthenogenetically. There are three forms of nematode in rotting earthworm nephridia, males, parthenogenetic females and non- parthenogenetic females. Dew gives reasons for assuming that they belong to the same species. He draws attention to the similarity of Stephenson's *Rhabditis terrestris* to *R. pellio* as described by Johnson in 1913. R.T.L.

(45i) A species of *Trichostrongylus* is common in man along the lower courses of the Tigris and Euphrates, decreasing northwards. In the Basrah area the incidence is 25·4%; at Nasriyah it is 14·2%. No cases were found above Kurmah or Amarah. Inland from the banks of the rivers it is almost unknown. Apparently, conditions of high humidity due to perennial swamps, dense shade as in palm forests, and grass or other low ground vegetation are necessary for the development and survival of the free-living stages. Although the incidence is high, the infections are light and their chief importance lies in the differentiation of the eggs from those of hookworm. The world incidence is tabulated from various publications. It is estimated that 50 million persons are infected. R.T.L.

46—Phytopathology.

a. HENRY, B. W., 1953.—"A root rot of southern pine nursery seedlings and its control by soil fumigation." **43** (2), 81–88.
b. CAIRNS, E. J., 1953.—"A culture-reared, plant parasitic nematode suitable for teaching and research." **43** (2), 105–106.
c. LOWNSBERY, B. F., 1953.—" Host preferences of the tobacco cyst nematode (*Heterodera* sp.)." **43** (2), 106–107.
d. OTEIFA, B. A., 1953.—" Development of the root-knot nematode, *Meloidogyne incognita*, as affected by potassium nutrition of the host." **43** (4), 171–174.

(46a) Henry reports on a root rot at a U.S. Forest Service nursery near Brooklyn, Mississippi, which although the cause was not clear was probably due to a nematode-fungus complex. The nematodes found associated with roots were: *Acrobeloides* sp., *Aphelenchoides parietinus*, *Diplogaster* sp., *Discolaimus* sp., *Ditylenchus* sp., *Dorylaimus* sp., *Panagrolaimus subelongatus*, *Pratylenchus leiocephalus*, *Tylenchus filiformis* and *Zeldia* sp. J.B.G.

(46b) A species of *Ditylenchus*, a recently discovered cause of serious losses in mushroom crops, can easily be maintained in inexpensive cultures without special environmental conditions as to bacterial contamination, aeration, temperature or light, and will remain dormant for long periods in solid, dried masses. It therefore is very suitable, not only for research in phytonematology and for testing potential nematicides, but also for teaching. R.T.L.

(46c) Further tests have shown that the preferred hosts of the *Heterodera* sp. found by Lownsbery in roots of Regular Shade tobacco in Connecticut in 1951 are *Solanum nigrum* and *S. burbankii*. Other hosts are *S. integrifolium*, *S. rostratum* and *S. dulcamara*. A few second-stage larvae, but no later stages, were found in roots of Katahdin and Green Mountain potatoes. The larvae of *H. rostochiensis* of the potato attacked, but did not mature in, *S. nigrum* and tests with *S. burbankii* by Mai gave negative results during two growing seasons. From these different host preferences it is concluded that there is at least an intra-species difference between the cyst nematode of tobacco and that of the potato. R.T.L.

(46d) Oteifa has studied the effect of the nutritional state of the host plant in influencing the length of the life-cycle of *Meloidogyne incognita* by supplying lima bean plants with different levels of potassium representing low, optimum and excessive concentrations. The seedlings in the three or four-leaf stage were transplanted to small pots each containing ten *M. incognita* egg masses. Three days later the roots were washed in tap-water. The plants were transferred to crocks filled with sterilized quartz sand. The nutrients were then added daily. One plant was removed every other day and a small portion of the root system was clipped off and examined until 100 parasites had been counted for each plant. Only minor differences in the development of the nematodes were noted between the entry of the larvae into the roots and their development to fully grown females but the potassium had considerable effect on the time needed for fully grown females to produce eggs. The rate of oviposition increased with the potassium supply. Excessive application of potassium favoured rapid development and reproduction and at the same time gave some protection against nematode injury. Oteifa concludes from these experiments that while the use of potassium fertilizers in nematode infested soils would increase plant growth provided the soil was deficient in potassium, it would also tend to increase the root-knot population. R.T.L.

47—Praktische Tierarzt (Der).

a. LEUCHTER, F., 1953.—" Die Bekämpfung des Menschenbandwurmes." Year 1953, No. pp. 46–47.

(47a) Leuchter discusses the control of *Taenia saginata* and *Cysticercus bovis*. He urg greater care in meat inspection and puts forward the suggestion that butchers should—perha at slightly increased price—guarantee that all meat sold had been kept at −3°C. to −4°C. f 24 hours. Another recommendation is that consumption of raw flesh should be forbidde but in view of the German predilection for raw minced beef, this would be difficult to enforc It is also important to prevent contamination of water or vegetables with human faeces. A.E.

48—Proceedings of the Helminthological Society of Washington.

a. MAI, W. F. & LAUTZ, W. H., 1953.—" Relative resistance of free and encysted larvae the golden nematode *Heterodera rostochiensis* Wollenweber to D-D mixture and hot water. **20** (1), 1–7.
b. SCHILLER, E. L., 1953.—" Studies on the helminth fauna of Alaska. XIV. Some cestod parasites of the Aleutian teal (*Anas crecca* L.) with the description of *Diorchis longiovum* n.sp. **20** (1), 7–12.
c. COBB, G. S. & TAYLOR, A. L., 1953.—" *Heterodera leptonepia*, n.sp., a cyst-formin nematode found in soil with stored potatoes." **20** (1), 13–15.
d. STIREWALT, M. A. & EVANS, A. S., 1953.—" An unsuccessful attempt to protect mic against *Schistosoma mansoni* by transfer of immune rat serum." **20** (1), 15–19.
e. SMITH, P. E., 1953.—" Host specificity of *Heterakis spumosa* Schneider, 1866 (Nematoda Heterakidae)." **20** (1), 19–21.
f. PERRY, V. G., 1953.—" The awl nematode, *Dolichodorus heterocephalus*, a devastating plan parasite." **20** (1), 21–27.
g. CHITWOOD, M. B. & ENZIE, F. D., 1953.—" The domestic cat a new host for *Capillari plica* in North America." **20** (1), 27–28.
h. HARWOOD, P. D., 1953.—" The use of lead arsenate mixed with phenothiazine for the removal of tapeworms from sheep and goats." **20** (1), 29–31.
i. DROPKIN, V. H., 1953.—" Studies on the variability of anal plate patterns in pure lines o *Meloidogyne* spp. the root-knot nematode." **20** (1), 32–39.
j. AMEEL, D. J., VAN DER WOUDE, A. & CORT, W. W., 1953.—" Studies on the miracidium of the genus *Trichobilharzia* with special reference to the germinal cells." **20** (1), 40–42.
k. CORT, W. W., AMEEL, D. J. & VAN DER WOUDE, A., 1953.—" Further studies on the early development of the daughter sporocysts of *Schistosomatium douthitti*." **20** (1), 43–49.
l. TARJAN, A. C., 1953.—" Known and suspected plant-parasitic nematodes of Rhode Island, I." **20** (1), 49–54.
m. TROMBA, F. G. & DOUVRES, F. W., 1953.—"A modified *en face* technique." **20** (1), 59
n. TARJAN, A. C. & SASSER, J. N., 1953.—" Observations on *Heterodera weissi* Steiner, 1949 (Heteroderidae, Nematoda)." **20** (1), 62–64.

(48a) Data are presented which indicate that free larvae of *Heterodera rostochiensis* are less resistant to D-D mixture and to immersion in hot water than those within the cysts. All the free larvae and practically all those within the cysts were killed in five minutes in water at 130°F. Although a hatching stimulant applied to heavily infected soil might shorten the rotations necessary to produce profitable crops of potatoes, only the discovery of a slowly volatizing solid which could be thoroughly mixed with the soil would provide a practical measure of control.

R.T.L.

(48b) Four cestode species were collected from 20 *Anas crecca nimia* on Amchitka, one of the Aleutian Islands: *Hymenolepis collaris*, *Fimbriaria fasciolaris*, *Diorchis acuminata* and, on one occasion, *D. longiovum* n.sp.; this new species is characterized by the differential spination of the pocket and margin of the suckers, and the elongate spindle-shaped eggs with long filamentous processes. This brings the number of species of *Diorchis* to 29 of which only *D. reynoldsi* occurs in a mammalian host: as an examination of this type specimen showed that there are three, not two, testes, and as the rostellar hooks number over 100, it is transferred to *Hymenolepis*. *D. nyrocae* of Long & Wiggins, 1939 *nec* Yamaguti, 1935 and *D. longae* of Schmelz, 1941 are shown to be synonyms of *D. wigginsi* Schultz, 1940. The paper concludes with a discussion of the function of the excretory system in a cestode. The occurrence of

immature eggs within the ventral excretory canal of the proglottides throughout the strobila suggests that the excretory system may also serve to maintain hydrostatic pressure and regulate the water balance within the worm. R.T.L.

(48c) *Heterodera* cysts were washed out of about 3 lb. of soil collected from about 3,400 lb. of potatoes from Peru taken at the Oakland port of entry into California. Twelve were cysts of *H. rostochiensis*. Three of the cysts were rounded posteriorly without protruding vulva. The anus was a minute pore. As the larva has a strikingly slender appearance which differentiated it from known species of the genus, the new form is named *H. leptonepia* n.sp. R.T.L.

(48e) Although *Heterakis spumosa* has not been found as a natural infection of the cotton-rat (*Sigmodon hispidus*), infections have been produced experimentally. Golden hamsters and guinea-pigs proved refractory. R.T.L.

(48f) At Sanford, Florida, severe stunting and depleted root systems in fields of celery and sweet corn and in water-chestnuts grown in hydroponic beds, were associated with the presence of large numbers of the ectoparasite, *Dolichodorus heterocephalus*. The symptoms were almost identical with those caused by *Belonolaimus gracilis* which it closely resembles. In pot experiments, severe injury on celery, maize, bean and tomato plants and moderate damage on pepper plants resulted. It was also demonstrated that *D. heterocephalus* could penetrate the seed coat and feed on the embryo and, after germination could kill the growing tip causing a pre-emergence damping-off. R.T.L.

(48h) It is confirmed that 1 gm. of lead arsenate is very effective and safe in removing Moniezia except in debilitated animals but 5 gm. to 7 gm. proved lethal. A mixture of lead arsenate and phenothiazine was as effective as when each drug was administered separately but there was little difference in toxicity between the pure salt and the mixture. R.T.L.

(48i) The degree of variability in the anal plate patterns was less in the offspring of a single *Meloidogyne acrita* larva than in those of mixed ancestry but no difference could be demonstrated in *M. arenaria*. This study suggests that the general shape and possibly some of the details of the anal plate patterns are hereditary. R.T.L.

(48j) In *Trichobilharzia*, as in other schistosomes, the germinal cells of the miracidium multiply considerably before penetration of the intermediate host is effected. The number of germinal cells counted in *Trichobilharzia elvae* ranged from 12 to 18, in *T. physellae* from 20 to 30 and in *T. stagnicolae* from 21 to 30. They are grouped in a solid elongate mass. R.T.L.

(48k) A detailed description is given of the development of the germinal material in the early stages of the daughter sporocysts of *Schistosomatium douthitti*; earlier observations by Cort *et al.* based on old preparations and heavy staining with neutral red are emended. It is now realized that all embryos develop directly from germinal cells and that no germinal masses are present in daughter sporocysts. R.T.L.

(48l) From Rhode Island descriptions are given of (i) *Longidorella parva*, a rare dorylaimid suspected of parasitizing chrysanthemum roots in green-houses in Long Island and (ii) *Discomyctus brevicaudatus* n.sp. from roots of *Buxus sempervirens* var. *arborescens*. The tail is dorsally convex and sub-digitate and differs from the other two species in which the tail is filiform. R.T.L.

(48m) A useful adjustment to Buhrer's technique for decapitating nematodes [se Helm. Abs., 18, No. 38b] consists of a plastic slide in which a longitudinal groove has bee scored with a sharp needle and then deepened with a round-ended probe giving it a U-shap in cross section. A transverse groove is then cut at right angles with a cataract knife to belo the level of the longitudinal groove and the lateral ends are slightly widened to enable th knife to be inserted easily. The grooving should be done under a dissecting microscope The specimen is placed in the longitudinal groove and fixed with glycerine gelatin which i allowed to solidify. Decapitation is effected by inserting the knife in the transverse groov and pressing it downwards. The further procedure is as described by Buhrer. The slid may be cleaned in hot water and briefly rinsed in ethyl alcohol (95%). R.T.I

(48n) Steiner's original diagnosis of *Heterodera weissi*, a parasite of knotweed *Polygonum pennsylvanicum*, is amplified and various stages in the life-cycle are illustrated b photomicrographs. R.T.L

49—Rivista di Parassitologia.

a. PELLEGRINI, D., 1953.—"Alcune osservazioni sulla schistosomiasi bovina in Somalia segnalazione del *Bulinus abyssinicus* nella regione del Basso Giuba." **14** (1), 15–17. [Englis summary p. 17.]
b. ZAFFINO, C., 1953.—" L'ossiurosi nelle colonie estive." **14** (1), 19–21. [English summar p. 21.]
c. RICCI, M. & MENNA, F., 1953.—" Sull'azione dell'esilresorcinolo verso alcuni elmint intestinali." **14** (1), 23–28. [English summary p. 27.]

(49a) *Schistosoma bovis* was found in the mesenteric veins of 133 out of 327 adult cattle slaughtered at Merca, Somaliland. The animals originally came from the lower Webi Shebeli area. The author quotes unpublished records by Angelotti and Sobrero that schistosomiasis also occurs in cattle and goats in the middle Webi Shebeli and lower Juba areas. *Bulinus abyssinicus* was found in the lower Juba. R.T.L

(49b) Of 115 children examined on arrival at a mountain health resort, 84·34% had Enterobius infection. Thirty days later, 98·26% were positive. Of 146 children examined on arrival at a seaside resort, 67·12% showed infection. Thirty days later, 87·66% were positive. It is suggested that the promiscuous life of the children during their stay contributed to the spread of the parasite. R.T.L.

(49c) Tablets of hexylresorcinol were administered to children mostly with mixed helminth infections. A single dose completely removed *Ascaris lumbricoides* in 76·47%. A second dose after an interval of four days raised the recovery rate to 90·91%. Of the *Enterobius vermicularis* cases, 50·82% recovered after a single dose and 77·78% after two doses. The dosage was based on 0·1 gm. for each year up to six years of age, 0·6 gm. for those six to eight years old and 0·8 gm. for those from eight to twelve years. R.T.L.

50—Science. Lancaster, Pa.

a. MANN, P. H. & FRATTA, I., 1953.—" Survival of microfilariae of *Dirofilaria immitis* in rats and mice." **117** (3027), 18.

(50a) As microfilariae of *Dirofilaria immitis* were present in the peripheral circulation of rats and mice at least three weeks after injection, the use of such rodents for screening potential filaricidal substances is suggested. R.T.L.

51—Systematic Zoology. Washington, D.C.

a. STUNKARD, H. W., 1953.—" Life histories and systematics of parasitic worms." **2** (1), 7–18.

(51a) Stunkard maintains that the developmental cycles of parasitic worms are bionomic adaptations to ecological conditions and have evolved concomitantly with the parasitic habit. Modifications in the life-cycles were introduced accidentally. As they facilitated dispersal and had survival value for the species, they have been perpetuated. Since convergence and divergence have resulted in changes in the morphology both of larval stages and of adults, their life-histories afford the most reliable source of information about their past history and systematic relationships. R.T.L.

52—Tijdschrift over Plantenziekten.

a. OOSTENBRINK, M. & STOFMEEL, W. J., 1953.—" Ontsmetting van bloembollen tegen *Heterodera rostochiensis*." **59** (1), 1–8. [English summary p. 8.]
b. KORSTEN, L. H. J., 1953.—" Een nieuwe methode voor bepaling van de vatbaarheid van klaverplanten voor het stengelaaltje (*Ditylenchus dipsaci* (Kühn) Filipjev)." **59** (1), 27–28. [English summary p. 28.]

(52a) The organic mercury compounds, Aaventa and Aabulba, which are regularly used in the Netherlands as dips for the control of fungal disease of bulbs are effective in destroying the cysts of *Heterodera rostochiensis* in adherent soil. Immersion in 0·25% of Aaventa killed cysts in six hours, in 0·5% in three hours and in 1% in one hour. These dilutions did not affect the germinative and productive powers of the bulbs of daffodil, hyacinth, iris, crocus, tulip and gladiolus tested, with the exception of the tulip variety Red Emperor. A table recording the number of hatched larvae per cyst after immersion in four different mercurial dips, Aaventa, Aabulba, Aretan and Bloembollengermisan, in similar concentrations, shows that Aabulba was even better than Aaventa. R.T.L.

(52b) A new large scale method of artificially infecting plants with *Ditylenchus dipsaci* is described. Clover is sown in boxes of sterilized soil. After emergence, the seedlings are sprayed with a concentrated suspension of eelworms in water and the boxes are placed in a room at 15°C. to 20°C., with high air humidity. Symptoms are clearly visible two weeks after inoculation. R.T.L.

53—Transactions of the American Microscopical Society.

a. DE ROTH, G. C., 1953.—" Some parasites from Maine fresh-water fishes." **72** (1), 49–50.
b. GRIFFITH, R. E., 1953.—" Preliminary survey of the parasites of fish of the Palouse area." **72** (1), 51–57.
c. KRUIDENIER, F. J., 1953.—" The formation and function of mucoids in cercariae: monostome cercariae." **72** (1), 57–67.
d. MARKELL, E. K., 1953.—" Further observations on the anatomy of the gorgoderid trematode *Probolitrema californiense*." **72** (1), 68–77.
e. JOHNSON, W. F. & COPSEY, J. E., 1953.—" *Opisthadena bodegensis* n.sp. (Trematoda) from Dillon Beach, California." **72** (1), 78–81.
f. AKHTAR, S. A., 1953.—"Another new genus of nematodes, parasitic in the pika." **72** (1), 82–86.
g. OGREN, R. E., 1953.—"A contribution to the life cycle of *Cosmocercoides* in snails (Nematoda: Cosmocercidae)." **72** (1), 87–91.

(53a) The 20 parasites of 12 species of Maine fresh-water fishes mostly from Pushaw Pond, near Orono, are arranged under their hosts. The list comprises six trematodes, four cestodes, three cestodarians, one nematode, two acanthocephalans, two leeches and two crustaceans. *Crepidostomum cornutum* and *Azygia angusticauda* in *Morone americana*, and *Philonema* sp. in *Salmo salar sebago* are new host records. R.T.L.

(53b) A preliminary survey of 181 fresh-water fishes belonging to 17 species in the Palouse area of south-western Washington showed that 52·5% were parasitized by helminths and/or crustaceans. Two tables give the rates of infection for the various streams and lakes and the various fish species. The parasites found are listed under each host; many of them were immature and not specifically identifiable. R.T.L.

(53c) This discussion of the status of the glandular complex in monostome cercariae is based on a detailed study of the metachromatic mucoid glands in *Cercaria urbanensis* and *C. novicia*. The mucoid glands entirely discharge their contents while the cercaria is still within the molluscan host. A secondary layer is added to the cuticle outside the primary metachromatic covering. The peripheral mucoid film and extra-cuticular sheath on young, pre-migratory cercariae afford protection against deleterious molluscan substances. R.T.L.

(53d) Markell confirms Stunkard's original account of the morphology of *Probolitrema californiense*, and describes the microscopic structure of the digestive, excretory and reproductive systems. The specific diagnosis is emended. The diagnostic characters of the seven species of *Probolitrema* so far recognized are tabulated. R.T.L.

(53e) *Opisthadena bodegensis* n.sp. from the stomachs of nearly all *Cebidichthys violaceus* in the Dillon Beach area, California, resembles *O. dimidia* but the pharynx is about the same size as the oral sucker. The anterior excretory tubes extend posterior to the ovarian region; the posterior testis is separated from the anterior testis by about 1·4 times its width and from the ovary by 4·3 times its width; the eggs measure 0·0479 mm. × 0·0204 mm. R.T.L.

(53f) A new oxyurid named *Pikaeuris pikaeuris* n.g., n.sp. heavily parasitizes *Ochotona rufescens* Gray in Kabul. It differs from *Labiostomum* in having six single-tipped, triangular lips and a buccal cavity armed with teeth. The male has a ventral row of crests in front of the cloaca. Male and female have pointed tails. From *Cephaluris* it differs in having six pointed teeth. The male has larger pre-anal and ventral crests which are longitudinal and laterally compressed and the caudal alae are wider. But the pair of cuticular, dorsal and backwardly directed cephalic shields, and a large median, post-anal and caudal papilla are absent. R.T.L.

(53g) The life-cycle of *Cosmocercoides dukae* from terrestrial snails is briefly described and figured. This forms a seventh group of nematodes living between the shell and mantle of their molluscan hosts. R.T.L.

54—Transactions of the Royal Society of Tropical Medicine and Hygiene.

a. KERSHAW, W. E. & ROSS, J. A., 1953.—" The radiological diagnosis of paragonimiasis in man by tomography." [Demonstration.] **47** (1), 4.
b. KERSHAW, W. E., ZAHRA, A., PEARSON, A. F., BUDDEN, F. H. & CAUCKI, F. J., 1953.—" Some observations on the distribution of filariasis and onchocerciasis in Nigeria and the British Cameroons." [Demonstration.] **47** (1), 4.

(54a) The routine X-ray examination of a Chinese seaman with cough and blood-stained sputum gave no indication of the underlying pathology. There was a small opaque area in the base of the right upper lobe of the lung. Tomographic films revealed that this was made up of about six contiguous cavities and was slightly elevated owing to fibrosis and de-aeration. The path of migration of the flukes to the lung is considered. R.T.L.

(54b) The distribution in Nigeria and the British Cameroons of *Loa loa* is confined to the rain forest and its fringe and to the fresh-water swamp. It is high in relatively undisturbed rain forest, higher in rubber plantations and lower in large towns. The incidence falls abruptly from the rain forest to the mountain grasslands of the Cameroons. *Acanthocheilonema perstans* has a high incidence in the rain forest of the Cameroons and on the Bauchi Plateau of Nigeria. It occurs as far north as Kano but is practically absent in a rubber plantation in the Niger

54—Transactions of the Royal Society of Tropical Medicine and Hygiene (cont.)

c. KERSHAW, W. E. & WILLIAMSON, J., 1953.—" The prophylactic activity of MSb (Friedheim) during an interval of six months in experimental filariasis." [Demonstration.] **47** (1), 5.
d. GORDON, R. M. & CREWE, W., 1953.—" The entrance of *Loa loa* into the mammalian host and the first stage of its migration to the deeper tissues." [Demonstration.] **47** (1), 6.
e. HOPKINS, C. A. & NICHOLAS, W. L., 1953.—" The development to the infective stage of *Acanthocheilonema perstans* in bred *Culicoides austeni*." [Demonstration.] **47** (1), 6–7.
f. VARMA, A. K., 1953.—" (1) Occurrence of *Elaeophora poeli* in Indian buffalo. (2) Onchocerciasis of the aorta of cattle in India. (3) Stephanofilariasis in cattle in India." [Demonstration.] **47** (1), 11.
g. BERTRAM, D. S., 1953.—" Delayed appearance of microfilariae of *Litomosoides carinii* in the peripheral blood of an infected cotton-rat." [Demonstration.] **47** (1), 12.

delta. The incidence of *Wuchereria bancrofti* is high in the savannah country and on the Bauchi Plateau. Its microfilariae were common in blood films taken at noon in Kano and at Jos but never at this hour in the Cameroons. In Nigeria, *Onchocerca volvulus* is widespread in very different types of country. It is present in the rain forest, in small coastal villages and in the mountainous regions of the Cameroons, in the more open country in eastern Nigeria and on the escarpment and gently sloping savannah surrounding the Bauchi Plateau, and in the dry savannah near Sokoto. Blindness is common in the Bauchi Plateau but rare in the Cameroons although eye changes are common. *Acanthocheilonema streptocerca* was noted in the Kumba and Mamfe divisions of the Cameroons. R.T.L.

(54c) When cotton-rats were injected with a single dose of 125 mg. of MSb per kg. body-weight, they were almost completely protected from experimental infections with *Litomosoides carinii* for six months (i.e. no adults were found in the pleural cavities). 60–70 mg. per kg. body-weight gave good protection for four months and partial suppression for a further two months (i.e. immature worms with arrested development in the pleural cavity). A dose of 35 mg. per kg. body-weight resulted in partial suppression for five months and 15 mg. per kg. body-weight gave protection for three months. R.T.L.

(54d) As soon as the labium of *Chrysops silacea* infected with *Loa loa* bends on penetrating the host's tissues the *Loa loa* larvae leave its proboscis for the deeply situated haemorrhage caused by the bite and, in laboratory animals, proceed thence to the underlying muscle layer within about 30 minutes. Those larvae which escape on to the skin are incapable of piercing the stratum corneum. In sections of human skin on which infected *Chrysops* had been fed, large numbers of larvae were found in the cutis vera. R.T.L.

(54e) Complete development of *Acanthocheilonema perstans* was observed in laboratory-reared *Culicoides austeni* which had been fed on persons free from all other filarial infections. After the fifth day elongate motile forms developed from the immotile "sausage" larvae. The larvae from the thoracic muscles had migrated into the insect's head by the ninth day. R.T.L.

(54f) *Bos bubalus* in Assam is recorded as host of *Elaeophora poeli* for the first time. In Bihar (India), *Bos indicus* is fairly frequently infected with *Onchocerca armillata* and *Stephanofilaria assamensis*. *S. assamensis* is very common in the plain cattle of Assam. R.T.L.

(54g) The microfilariae of *Litomosoides carinii* normally appear in the blood of cotton-rats on about the 50th day after experimental infection. In one instance microfilariae failed to appear as late as the 92nd day, although eight adult females which were then found contained many microfilariae and some microfilariae were present in the pleural fluid. It is suggested that repeated copulation interfered with the normal release of the microfilariae. R.T.L.

54—Transactions of the Royal Society of Tropical Medicine and Hygiene (cont.)

h. WATSON, J. M., 1953.—" Bilharziasis in south Persia." **47** (1), 49–55.
i. McQUAY, Jr., R. M., 1953.—" Studies on variability in the susceptibility of a North American snail, *Tropicorbis havanensis*, to infection with the Puerto Rican strain of *Schistosoma mansoni*." **47** (1), 56–61.
j. ADAMS, J. C. L. & WOODRUFF, A. W., 1953.—" Diethylcarbamazine in the treatment of onchocerciasis." **47** (1), 66–69.
k. HAWKING, F., 1953.—" The periodicity of microfilariae. III. Transfusion of microfilariae into a clean host." **47** (1), 82–83.

(54h) Although vesical schistosomiasis has increased in recent years among employees on Abadan Island, cases were traceable to an extension eastwards, towards the Iranian city of Ahwaz, of the heavy endemic area of the Amarah marshes on the east bank of the lower Tigris in Iraq. That no specimens of *Bulinus truncatus* could be found on Abadan Island is attributable to the periodic occurrence of high salinity in the Shatt-al-Arab and Bahmashir rivers which provide the island with its fresh water. R.T.L.

(54i) McQuay reviews briefly the literature dealing with the variability in the susceptibility of strains of molluscan intermediaries to strains of *Schistosoma mansoni*. He records the results of an investigation to determine whether the susceptibility of *Tropicorbis havanensis* to infection with *S. mansoni* could be influenced by breeding from susceptible snails. Age susceptibility was also investigated. A colony of *T. havanensis* was established from two adult snails from the lake at the Louisiana State University. As controls he used a Puerto Rican strain of *Australorbis glabratus*. He describes in great detail how variability among the snails and among the miracidia was reduced. Specimens of *T. havanensis* for exposure were reared from individually maintained and self-fertilized snails. The strain of *S. mansoni* was standardized by using male and female cercariae discharged by snails previously exposed to one miracidium each. Age susceptibility in each snail was based on shell diameter at the time of exposure or re-exposure individually to 20 miracidia while the control snails were exposed to 5 miracidia each. The susceptibility of *T. havanensis* to this standardized strain of *S. mansoni* was not markedly increased by the selection of susceptible inbred stock through five to eight generations. A 6·9% infection rate followed first exposures while an additional 9·9% proved susceptible on one, two or three re-exposures. Age and/or size appeared to influence susceptibility. Adults (shell diameter 6–9 mm.) and large juveniles (4–5 mm.) were more susceptible than medium juveniles (2–3 mm.) and small juveniles (1 mm. or less). P.L.leR.

(54j) Eleven European cases of onchocerciasis with pruritus and marked eosinophilia received a standard course of treatment with 6 mg. of hetrazan per kg. body-weight daily (in three equal doses) for seven days, followed by 9 mg. per kg. body-weight for 14 days. The pruritus and eosinophilia increased during the first few days and only in the two least severely affected was there any lasting improvement in the skin lesions. In one case in which there were corneal opacities, the eye changes were improved. R.T.L.

(54k) Hawking describes an experiment in which 150 c.c. of blood containing large numbers of microfilariae of *Dirofilaria repens* were transfused from an infected dog into an English dog. More than 80% of the transfused microfilariae disappeared from the recipient's blood immediately but the remainder persisted in diminishing number for 68 days. A chart of the changes at different times of the day and night in the number of microfilariae in the blood of both dogs gives clear evidence of a diurnal periodicity in the recipient which is almost indistinguishable from that in the donor dog. The general results were in agreement with those of previous investigators. R.T.L.

4—Transactions of the Royal Society of Tropical Medicine and Hygiene (cont.)

l. REID, J. A., 1953.—" Transmission of filariasis." [Correspondence.] **47** (1), 84.
m. BERTRAM, D. S., 1953.—" Laboratory studies on filariasis in the cotton-rat." **47** (2), 85–106. [Discussion pp. 107–116.]
n. GERRITSEN, T., WALKER, A. R. P., DE MEILLON, B. & YEO, R. M., 1953.—" Long term investigation of blood loss and egg load in urinary schistosomiasis in the adult African Bantu." **47** (2), 134–140.
o. VENKATACHALAM, P. S. & PATWARDHAN, V. N., 1953.—" The role of *Ascaris lumbricoides* in the nutrition of the host. Effect of ascariasis on digestion of protein." **47** (2), 169–175.

(54l) When fed on a patient with an average of 350 microfilariae of *Wuchereria malayi* er 60 c.mm. of blood, *Anopheles barbirostris* discharged from the tip of the abdomen a drop f blood containing one to 18 unaltered microfilariae but *Mansonioides annulifera* voided clear erum-like fluid containing none. This behaviour may explain the concentration of micro- lariae which has been observed in some vectors. R.T.L.

(54m) Bertram gives the results of experiments in which cotton-rats were exposed to epeated reinfection with *Litomosoides carinii*. The findings in uncomplicated cases, i.e. otton-rats exposed to infection once only (during the course of one day) are first summarized. The reinfection experiments confirmed that the rats are susceptible to reinfection and also stablished that considerable numbers of worms may result from it. In such animals the ensity and duration of the microfilariae became much decreased and they finally disappeared rom the peripheral blood although many adult worms remained in the pleural cavity. There vas infrequent invasion of the peritoneal cavity by adult worms and when this occurred nicrofilariae were still found in the peripheral blood. The effect of superinfection on the rats vas to cause them to be lethargic and sub-normal in weight. In discussing the results the uthor considers their implications in problems of human filariasis, such as the low micro- larial incidence in people, especially children, in endemic areas; the progressive increase vith age in the microfilarial incidence in a population; and the assessment of the effectiveness f vector control. J.J.C.B.

(54n) Eight adult Africans suffering from schistosomiasis haematobia and persistent aematuria were selected for this investigation of blood loss and egg load. Urine was collected ontinuously from them for ten days in six cases and 19 days in two, and twelve-hour samples vere tested for the quantity of blood present and the number of eggs was calculated. The blood oss was smaller than was expected, varying from 1·3 to 6·1 ml. per day and was not con- idered sufficient to cause hypochromic anaemia. There was great variation in the numbers f eggs passed. One subject passed 85,000 eggs in a twelve-hour period and in three other eriods was almost egg-free. J.J.C.B.

(54 o) Nine children harbouring *Ascaris lumbricoides*, otherwise worm-free, were selected or an investigation of the effect of this infection on digestion of protein. They were observed or 18 to 19 days during which they were kept on a diet allowing constant intake of nitrogen. Faecal nitrogen was estimated in 24-hour collections both before and after the children were le-wormed, and it was found that nitrogen excretion decreased significantly after disinfestation. Two worm-free controls showed no decrease after anthelmintic treatment. The implications f these results are discussed in relation to the interference of the worms with the digestion nd absorption of protein. J.J.C.B.

55—Tropical Medicine and Hygiene News.

a. JACHOWSKI, Jr., L. A., 1953.—" Transmission of nonperiodic filariasis in the South Pacif **2** (1), 5–9.
b. RITCHIE, L. S., 1953.—" Schistosomiasis in Formosa." **2** (2), 8.

(55a) From a study of data collected in American Samoa, Jachowski rejects t commonly accepted belief that the native village is the hyperendemic focus of non-perio filariasis. The data indicate that there are diffuse foci of transmission in the bush along t permanent trails leading from the villages to the family plantations where the men spend m of the day cultivating food and copra crops and that the women, who are rather closely bou to their homes by domestic responsibilities, show an incidence of infection much lower th that in the men. Until puberty there is little difference in the microfilarial rate in the sex The vector, *Aëdes pseudoscutellaris*, is absent from the large villages where the bush and scr have been cleared and rubbish has been systematically collected. R.T

(55b) Dr. H. F. Hsü and his associates found only five doubtful cases of schistosomias japonica in a survey of about 4,000 individuals in the endemic centre in Formosa. Ritch then tested about 2,500 persons in six villages with adult *Schistosoma japonicum* antige Positive reaction ranged from 4% to 17% in the different villages. The average inciden was 7% to 8%. Reactions in children were infrequent. Dr. Hsü's group then concentrate on the reactors but without added success. A high infection rate was noticed in dogs and lesser rate in wild rodents. Monkeys were refractory to experimental infection. It is conclude that man is not a favourable host for *Schistosoma japonicum* in Formosa and that the disea is not a matter of public health concern there. R.T.

56—Veterinarski Arhiv.

a. RICHTER, S., 1953.—" Entoparasitska fauna kunića (*Oryctolagus cuniculus*)." **23** (1/2 53–57. [English & German summaries p. 57.]
b. VRAZIĆ, O., 1953.—" Entoparasitska fauna goluba (*Columba livia domestica*)." **23** (1/2), 58–6 [English & French summaries pp. 61–62.]
c. MIKAČIĆ, D., 1953.—" Preparasitski razvoj pripadnika Strongylidae iz crijeva konja **23** (3/4), 87–92. [French & German summaries p. 92.]
d. BENKO, V., 1953.—" Parasitska fauna bijeloga štakora i bijeloga miša." **23** (3/4), 112–12 [French & German summaries pp. 122–123.]

(56a) The helminths found at post-mortem examinations on 55 rabbits in Zagreb wer *Fasciola hepatica*, *Passalurus ambiguus*, *Trichuris leporis*, *Cittotaenia denticulata*, and *Cysticercu pisiformis*. In nine instances, *C. pisiformis* occurred in the retro-peritoneal connective tissue R.T.L

(56b) Of 32 adult pigeons autopsied at Zagreb, 11 were found to be infected wit *Ascaridia columbae* and 25 with *Capillaria columbae*. R.T.L

(56c) From 3½ days at 28·7°C. to 15 days at 12·3°C. are required for the developmen to the infective stage by larvae of *Trichonema* species whereas the development of *Strongylu vulgaris* larvae is slower. Eggs containing rhabditiform larvae in rapidly dried faeces ar capable of developing to the infective stage even after desiccation for 12 days. In view of th larvicidal effect of anaerobiosis observed by Lucker in 1935 [for abstract see Helm. Abs., 4 No. 55i], the author suggests that a simple method of killing strongylid larvae might be appli cable on pastures. R.T.L

(56d) The helminths present in 35 laboratory white rats were: *Hymenolepis nana* in 11·4%, *Cysticercus pisiformis* in 2·8%, *C. fasciolaris* in 2·8%, *Trichosomoides crassicauda* in 68·6%. Present in laboratory white mice were: *H. nana* 25·7%, *C. fasciolaris* in 2·8% *Catenotaenia pusilla* in 22·9%, *Aspiculuris tetraptera* in 65·7%, *Syphacia obvelata* in 14·3%. The females of *T. crassicauda* measured 11–16 mm. in length, whereas according to York & Maplestone their length ranged from 10·5–13 mm. *H. nana*, *C. pusilla*, *S. obvelata* and *T. crassicauda* have not been reported from Zagreb previously. R.T.L.

7—Veterinary Medicine.

a. MILAKNIS, A., 1953.—"An improved technic of fecal examination." **48** (1), 41.
b. TODD, A. C., WYANT, Z. N., ELAM, G. W. & STONE, W. M., 1953.—" On the blood picture of sheep exposed to the medium stomach worms. III. Second and third exposures." **48** (3), 102–105, 110.
c. MOORE, A. D., 1953.—" Trichinosis conference recommends legislation prohibiting raw garbage feeding." [Abstract of report of National Conference on Trichinosis, Chicago, December 1952.] **48** (4), 158.

(57a) The ordinary flotation technique for faecal examination is improved if the test ıbe is replaced by an Erlenmeyer flask of 50 ml. capacity and a bacteriological loop with a mm. diameter is used instead of a glass rod to transfer drops of the meniscus to the ıicroscope slide. R.T.L.

(57b) Parasitic infections may cause failure to gain weight, loss of weight or even death, epending on the age, diet and previous exposures, and on the number and virulence of the arasites. The greatest injury to the host occurs in the interval between exposure to infection nd the attainment of maturity by the parasites. Data are presented on the effect on the blood ictures of three lambs after receiving a second and third dose of infective larvae of *Ostertagia ircumcincta* and *O. trifurcata*. Macrocytic hypochromic anaemias developed between infection nd before the parasites matured. The earlier exposures delayed the maturity of the later ıfections. Host recovery from infection was associated with the beginning of egg production y the parasites. All these experimental infections were subclinical in effect. R.T.L.

(57c) The National Conference on Trichinosis held in Chicago in December 1952 was ıformed that autopsies on 10,000 persons indicated that 16% had been infected with *richinella spiralis* and that had the examination been more thorough the rate would have robably reached 30%. The Conference therefore recommended that all States in the U.S.A. hould pass laws prohibiting the feeding of uncooked garbage and offal to pigs, that the terilizing of garbage should be licensed and periodically inspected, and that the possibility f imposing federal quarantine which would prohibit the movement of live pigs, dressed ork or pork products from those States lacking such legislation should be studied further. R.T.L.

8—Veterinary Record.

a. JARRETT, W. F. H., McINTYRE, W. I. M. & URQUHART, G. M., 1953.—" Recent work on husk. A preliminary report on an atypical pneumonia." **65** (10), 153–155. [Discussion p. 156.]
b. KINGSBURY, P. A., 1953.—" *Nematodirus* infestation—a probable cause of losses amongst lambs." **65** (11), 167–169.
c. MILLER, W. C., 1953.—" The general problem of parasitic infestation in horses." **65** (14), 213–216. [Discussion pp. 216–217.]
d. GUILBRIDE, P. D. L., 1953.—" *Syngamus ierei, Physaloptera praeputialis* and *Platynosomum fastosum* from a cat in Jamaica." **65** (14), 220.
e. PEEL, C., 1953.—"Apparent acquired immunity to *Cysticercus bovis* in certain age groups of the N'dama cattle of Sierra Leone." **65** (16), 244–247.

(58a) In an investigation on husk, a widespread and serious specific pneumonia has been ecognized which causes calf morbidity and cannot be related to the presence of lungworms. t may, however, affect an animal suffering from parasitic bronchitis. As it is characterized y an expanding peribronchial lymphoid hyperplasia and gives the appearance of a peri-ronchial cuff, the term "cuffing pneumonia" is suggested for the disease. The main outbreaks ı Scotland occur during approximately the same months as parasitic bronchitis; but it is not ıerely a secondary infection as it is often present in milk-fed, housed calves. When calves ıffering from this disease are turned out to grass on which larvae of *Dictyocaulus viviparus* re present, a very dangerous combination results. A previous infection with the "cuffing neumonia" may predispose to a heavier lungworm infection. R.T.L.

(58b) On 75% of the farms on the eastern border counties of England and Scotlar a disease, apparently associated with heavy infections with Nematodirus, reached seriou proportions in the lowland flocks in the spring of 1951. A 10% mortality was not uncommo Anthelmintic treatment with phenothiazine or copper sulphate and nicotine was practical useless. There was intense scouring and death from dehydration occurred within two day The Nematodirus burden in 19 lambs averaged 11,626. Evidence was obtained that hexa chlorethane was of value as a preventive where the other anthelmintics failed. R.T.

(58c) A very rough indication of the number of species of intestinal helminths presen in the horse can be obtained if worm egg counts and differential larval percentage figures ar both available to the clinician but their interpretation is not always easy. An average count c less than 100 eggs per gramme for the horses on a stud indicates that no immediate steps nee be taken. Averages from 100 to 500 e.p.g. are marginal cases and only in young horses nee treatment be given as a rule. Above 500 e.p.g. treatment is definitely required, especially there are several young animals in the group. Early symptoms of Ascaris infection, especiall in foals, call for anthelmintic treatment. The so-called "summer colds" with coughing an a whitish nasal discharge, with occasionally bronchitis, are often due to larval migration The main principles of control are defined and discussed in detail. Stress is laid on the in fluence of nutrition, on the necessity of a sustained effort and of repeated dosing. The faece of each horse in a stud should be examined quarterly. All new arrivals should be regarde as potentially dangerous and be treated in quarantine before joining a stud. R.T.I

(58d) Guilbride reports the occurrence in Jamaica for the first time of *Syngamus iere Physaloptera praeputialis* and *Platynosomum fastosum* in the cat. R.T.I

(58e) The incidence of *Cysticercus bovis* in 1,000 cattle of the N'dama breed, slaughtere at the Freetown abattoir in Sierra Leone, averaged 38·4%. Most of the cattle in Sierra Leon are imported from French Guinea by nomad Foulahs and are grazed on open savannah lan in the north-east of the Northern Province of the protectorate. There was a striking differenc in age incidence. It was 54·96% in animals under two years, 43·11% in the two to three year-olds, 39·34% in the three to four-year-olds and 23·09% in those over four years old The cysticerciasis was generalized in 7·29% of the infected cattle. In those over four year old it was only 1·18%. Another batch of 100 cattle over four years old was examined an *C. bovis* was present in 10%. There was no generalized case. Published work on immunit to *C. bovis* is reviewed. It is concluded that there are two types of immunity: a temporary on conferred by a single infection which lasts as long as the cysts remain alive, and a more or les permanent one resulting from repeated infections over a period of years. Cysticerciasis i cattle and taeniasis in man might in time be controlled if the economics of the meat industr could be adapted to the slaughter solely of cattle showing a full mouth of teeth. R.T.L

59—West African Medical Journal.

a. ZAHRA, A., 1953.—"Some notes on the incidence of schistosomiasis in the southern Cameroons." New series, **2** (1), 26–29.

(59a) Schistosomiasis has not hitherto been recognized in the British Cameroons Endemic centres have now been discovered at the villages of Barombi Mbo and Barombi Kotto, on the shores of lakes of the same names in the Kumba Division. At Barombi Mbo 91%, and at Barombi Kotto 76% of persons examined had *Schistosoma haematobium* eggs in the urine. On the "overside" area of the lake Barombi Kotto where there is a small settle ment from the Grassfield area, the incidence was 21%, while in the New Town 2½ miles from the lake, only one out of 67 persons was positive. *Bulinus* was found with difficulty and i small numbers on the margin of the lake adjacent to Barombi Mbo village but it was presen in large numbers in Barombi Kotto lake. R.T.L

60—Wiener Medizinische Wochenschrift.

a. HOFMANN-CREDNER, 1953.—"Beitrag zur Oxyurentherapie mit Vermalon, einem Phenothiazin-Präparat." **103** (11), 213–214.

(60a) Hofmann-Credner reports favourably on the efficacy of Vermalon, a phenothiazine preparation, against enterobiasis in man. It is made up in tablets each containing 0·15 gm. phenothiazine and 0·005 gm. phenolphthalein and a total of 3 tablets per kg. body-weight was administered in four doses during a single day. Of 20 patients so treated only two were still positive for ova after 34 days: when the 18 negative patients were examined on the 54th day after treatment 16 were still negative. The drug was well tolerated and there were no side effects, not even in the case of one 64-year-old patient who repeated treatment on eight successive days and took a total of 26·4 gm. phenothiazine during this period. A.E.F.

61—Wiener Tierärztliche Monatsschrift.

a. HIRSCHMANN-DAVID, O., 1953.—"Massenbefall von *Sanguinicola*-Eiern bei Barben." **40** (3), 154–158. [English, French & Italian summaries p. 158.]

(61a) Eggs corresponding to those of *Sanguinicola inermis* were found in large numbers in the liver, heart muscle and spleen of a barbel. R.T.L.

62—Zeitschrift für Tropenmedizin und Parasitologie.

a. KUHLOW, F., 1953.—"Bau und Differentialdiagnose heimischer Diphyllobothrium-Plerocercoide." **4** (2), 186–202. [English summary p. 202.]
b. KUHLOW, F., 1953.—"Beiträge zur Entwicklung und Systematik heimischer Diphyllobothrium-Arten." **4** (2), 203–234. [English summary p. 233.]
c. WAGNER, O. & BAUER, F., 1953.—"Dermatitis verminosa durch freilebende Nematoden." **4** (2), 235–242. [English summary p. 242.]

(62a) *Diphyllobothrium* adults were experimentally reared in their definitive hosts from plerocercoids collected from six out of 16 species of fish caught in the lower Elbe, viz., *D. dendriticum* from *Gasterosteus aculeatus* and *Trutta trutta*, *D. vogeli* n.sp. from *G. aculeatus* and *G. pungitius*, *D. osmeri* (n.comb. for *Bothriocephalus osmeri* von Linstow, 1878) from *Osmerus eperlanus*, and *D. latum* from *Lota lota* and *Perca fluviatilis*. Kuhlow observed in these four plerocercoids certain new morphological features, viz., cuticular bristles and frontal glands which permit of the differentiation and exact classification of the species. These differences are tabulated. This is the first occasion on which the plerocercoids of *D. latum* have been found in the Elbe. Apparently the infection has been introduced recently. The plerocercoid *D. vogeli* n.sp. is characterized by its small size and its pointed posterior end. The sucker grooves are very short and the whole body is clothed with long cuticular bristles. R.T.L.

(62b) In the lower Elbe, plerocercoids of *Diphyllobothrium osmeri* were present in 81% of fully grown *Osmerus eperlanus*. Although they reach the strobila stage in *Larus argentatus*, their unusually slow development suggests that this gull is not the normal host which presumably is the seal, *Phoca vitulina*. A mature specimen of *Diphyllobothrium* was also obtained when this gull was fed on *O. eperlanus*. The eggs gave rise to procercoids in *Cyclops strenuus*. In *L. ridibundus*, plerocercoids from naturally infected *Gasterosteus aculeatus* and *G. pungitius* developed into *D. vogeli*. Its procercoids also developed in *C. strenuus*. With material obtained from Sweden, procercoids of *D. latum* were raised in *C. strenuus* and *Diaptomus vulgaris* and its plerocercoids were raised in *G. pungitius*, *Acerina cernua* and *Perca fluviatilis* (but not in *G. aculeatus*, *Anguilla anguilla* or *Tinca tinca*): when, 70 days to seven months after infection, the fish were fed to dogs and man, the results were negative. This is taken to suggest that the full development of *D. latum* in these fishes is extremely slow. The plerocercoids of *D. latum* from naturally infected *Lota lota*, when transferred to toads (*Xenopus*) by feeding, subcutaneous implantation and intraperitoneal injection, remained alive and infective for several months, but those of *D. dendriticum*, *D. osmeri* and *D. vogeli* rapidly died. Details are

given of the morphological differences in the strobila of the various species of *Diphyllobothriu* and of the structure, length of development and host preferences of the procercoid a plerocercoid stages whereby these can be classified. The adult of *D. vogeli* is now describe Its strobila measures 29 cm., the ovary is pincer-shaped and the shell gland has a half-moo outline. A table lists the first and second intermediate hosts of the eight species of *Diphy lobothrium* which are known to occur in birds. R.T.

(62c) Scab-like lesions located mainly on the head and posterior portion of the body two hamsters, *Cricetus cricetus*, were attributable to percutaneous invasion by rhabditic larv of a free-living soil nematode. The adults were found only in the litter of the cages a resembled *Rhabditis teres* although the spicules and papillar arrangement were identical wi those of *R. strongyloides*. Attempts to infect hamsters and dogs, even when these anima were suffering from skin diseases, proved negative. R.T.

63—Zoologischer Anzeiger.

a. ANDRÁSSY, I., 1953.—" Freilebende Nematoden aus einer Torf-Probe. Nematologisch Notizen. I." **150** (1/2), 30–35.
b. GUNHOLD, P., 1953.—" Drei neue Nematoden aus den Ostalpen." **150** (1/2), 35–38.

(63a) Of the 19 species of free-living nematodes collected from a fresh sample of pe at Feketebézseny, Somogy, three are new records for Hungary, viz., *Dorylaimus holsaticu Anguillulina costata* and *Procriconema membranifer*. *Acrobeles soosi* n.sp. is distinguished fro other species of the genus by its long oesophagus. R.T.

(63b) *Plectus vindobonensis* n.sp., *Criconema longula* n.sp. and *C. elegantula* n.sp. a briefly described and illustrated. R.T.

NON-PERIODICAL LITERATURE

64—INDIAN SCIENCE CONGRESS, LUCKNOW UNIVERSITY, 40th Sessio (1953). Souvenir volume edited by Kali Prasad.

a. THAPAR, G. S., 1953.—"An outline of the fauna of Uttar Pradesh, with special reference t their ecological distribution." pp. 54–67.
b. THAPAR, G. S., 1953.—" Department of Zoology." pp. 225–228.
c. THAPAR, G. S., 1953.—" Development of research in helminthology and helminthiasi scheme." pp. 228–231.

(64a) Under "Parasitic Fauna" Thapar refers to the extensive studies on the helmint fauna of Uttar Pradesh carried out at Lucknow and Allahabad, and on systematic helminthology and the incidence and life-histories of helminth parasites of domesticated animals, under a scheme of the Indian Council of Agricultural Research, at Lucknow. R.T.L.

(64b) In this account of the organization of the Department of Zoology in the University of Lucknow it is stated that during the last 20 years over 100 original papers on helminthiasis have emanated from this Department, and that for the past 15 years investigations have been carried out continuously on the helminthiases of domesticated animals in Uttar Pradesh, Bihar, Bengal, Orissa and Assam, with the financial support of the Indian Council of Agricultural Research. R.T.L.

(64c) Thapar reviews the contributions to helminthology which have been made by research workers at the Indian Universities and particularly at the University of Lucknow. R.T.L.